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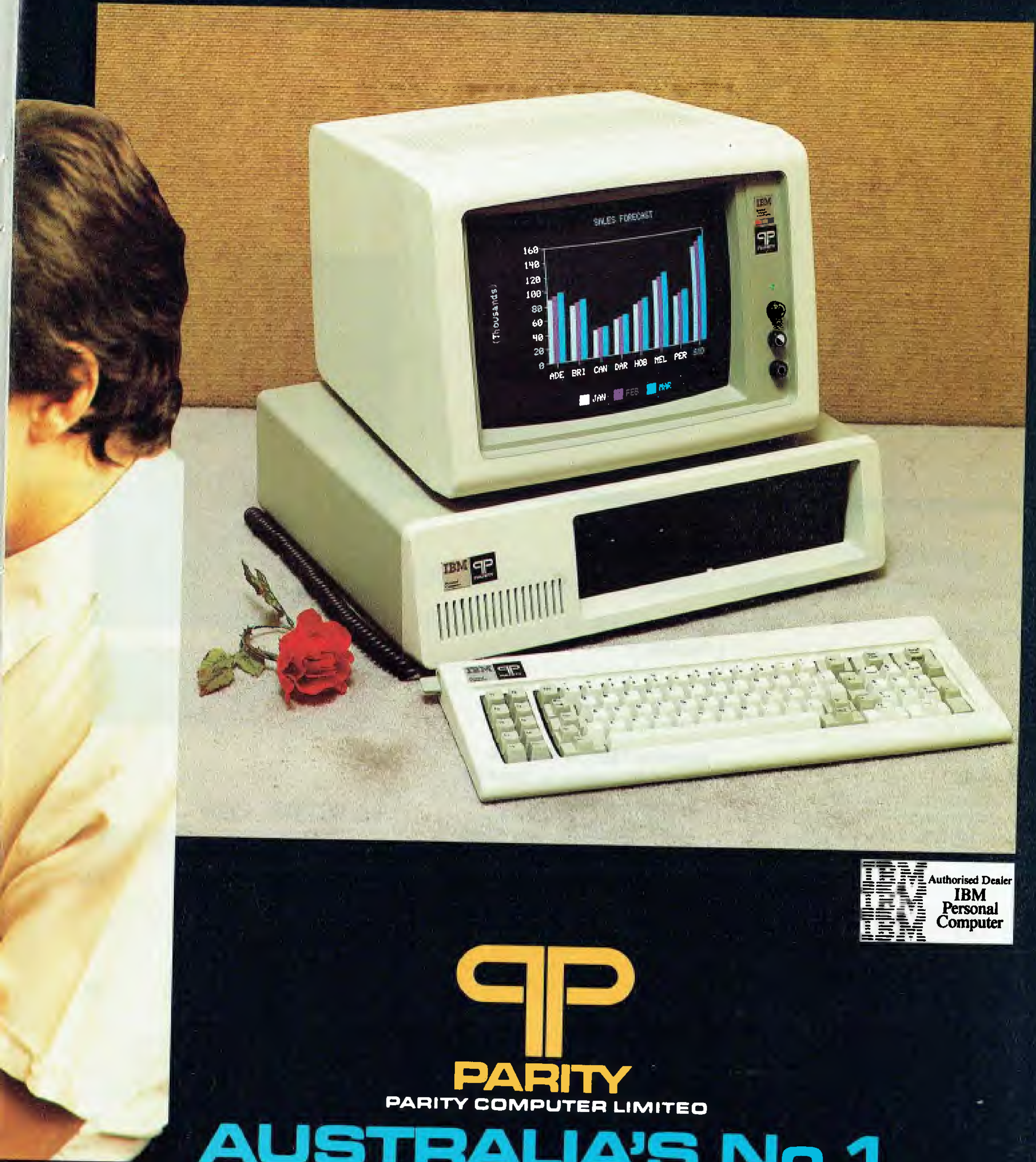

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IBM PC AT FINALLY LAUNCHED IN AUSTRALIA

IBM Australia put an end to almost a year of speculation by announcing the local release of the PC AT supermicro on June 12, just in time to take advantage of the last few weeks of the 18 per cent investment allowance. As predicted, the PC AT will be manufactured at IBM's Wangaratta assembly plant, although the resulting price will still be prohibitively high for the average PC user. Prices start at $A7821 for the bare-bones unit, and move up to $A11,256 for the enhanced version, which incorporates a 20M-byte fixed disk drive.

Coincidentally with the AT announcement, IBM released TopView, PC Xenix, PC-Dos 3.1 and the PC Network, all of which were demonstrated at a Showcase presentation on June 12. Just before the AT announcement, IBM launched the high-powered 3270-PC GX graphics system, bringing Australia almost up to date with the US range of PC products. All that remains is the new PC laptop portable, which will probably take some time to reach Australia.

In one sense, Australia could be considered ahead of the US, as far as the IBM PC product range is concerned, and that is in regard to the PC JX, recently declared by the Victorian Education Department as one of the systems considered suitable for schools. The PC JX is an enhanced version of the PC jr (including 3.5in disk drives) built by IBM Japan.

Although the PC AT and other related products have been officially announced and will be assembled in Australia, the systems are not expected to be available in quantities until September. Until then, potential buyers will have to be satisfied by playing with the demo models at their local PC dealer's shop, if the dealer has been lucky enough to receive one.

4700 PC links up to ATMs: Buried within IBM's recent spate of new product announcements was the release of the 4700 PC in Australia. The IBM 4700 PC will connect to IBM's 4700 Finance Communication System (FCS), and can work with keypads for entering personal identification numbers (PINs), magnetic stripe card readers, passbook printers and other devices in the 4700 FCS family. A security option also provides for the encryption and decryption of sensitive data.

A selection of finance software has also been announced with the 4700 PC system, which is obviously aimed at IBM's larger corporate and financial clients. For this reason the 4700 PC system, like the 3270-PC family, will only be marketed through IBM direct, and not through the PC dealer network.

APCON
85

Don't forget Apcon 85 the inaugural PC users convention to be held at the Masonic Centre in Sydney on September 3-4. Phone Sheila Philippsohn (02) 663 3919 for details.

More AT compatibles on the way: The number of IBM PC AT compatibles has doubled with the announcements by Corona Data Systems, Zenith Data Systems and Televideo Systems, of personal computers using Intel's 80286 Microprocessor, the heart of the PC AT.

The 80286 chip of the Televideo AT, however, reportedly operates at 8 MHz, 2 MHz faster than the speed of the 80286 chip in IBM's PC AT and the compatibles from Zenith and Corona. A switch in the Televideo AT slows the 80286 chip to 6 MHz to run timing-dependent PC AT software. An Australian release is scheduled for early July, but prices have not been announced by distributor, Data Peripherals.

Zenith's Z-200 is said to incorporate "no wait-states" technology, eliminating claimed processing delays built into the PC AT. Corona's machine is a 17kg unit that the company says is the first AT-compatible transportable. The Corona AT Transportable comes with a builtin 9in green-screen monochrome monitor and a color/monochrome video graphics card.

Like IBM's AT, the machines reportedly will be offered in standard and enhanced editions, the latter models with 20M-byte hard disks. Corona's standard machine, the ATP-6-QD, is said to offer one 1.2M-byte drive, one 360K-byte drive, 512K-bytes of memory and a price of $US4500. The enhanced version, the ATP-6-Q20, comes with 512K-bytes of memory, one 1.2M-byte drive and a $US5500 price tag. US deliveries for both will begin in July. AWA has not announced Australian release dates, or prices.

The standard Zenith Z-200, priced at $US3999, comes with 512K-bytes of Ram, expandable to 16M-bytes, one of Ram, expandable to 16M-bytes, one 1.2M-byte diskette drive, six AT-compatible expansion slots and Microsoft's MS-Dos 3.1. An enhanced version is offered for $US5599.

Warburton Franki expects to release the Z-200 in August.

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PC HOTLINE

Will high XT sales kill the PC? US dealers report that IBM's price cuts and new versions of the PC XT have boosted XT sales and cut into PC sales to the point where IBM's new product-positioning strategy may signal the end of the PC.

Many observers believe that IBM is working off its inventories of XTs. Some estimate that IBM has 500,000 personal computers (PCjrs, PCs, Portables, XTs and ATs) in inventory. This high level of inventory may create "fire sale" prices before the end of the year. Such pricing could mar the fortunes of dealers, IBM-compatible manufacturers and even IBM's bottom line, some analysts believe.

Along with price cuts of 4 per cent to nearly 12 per cent on IBM personal computers, IBM last month announced two new XT Models. At $US2270, the single floppy non-hard disk version of the XT is now only $US275 more than the single floppy PC. Since this announcement, sales of the XT have picked up dramatically, while PC sales have fallen.

Observers believe this pricing means that IBM is dropping the PC in favor of the XT, so as to reduce manufacturing costs by standardising on one hardware architecture.

IBM's elimination of the PCjr and addition of two new XT models indicate a change in the company's product positioning, observers said. With the PC de-emphasised and the PCjr discountinued, IBM's PC offerings have moved up several notches in sophistication, analysts believe. In addition, supplies of the AT are increasing, and IBM will soon introduce co-processor-equipped versions of the AT that will compete against minicomputers.

In addition, this summer IBM is expected to introduce the PC II (a "baby" AT using the 80286 chip), which will be positioned between the XT and the AT.

Although IBM's minicomputer products are moving up in the level of sophistication, pricing is expected to be aggressive, observers said.

IBM LAUNCHES INFOSEARCH FOR PC USERS

IBM Australia has announced a toll-free electronic help service for all PC users, accessible through authorised PC dealers. It is also possible to access the new Infosearch service through a communications package and modem, although this privilege is reserved for large organisations with multiple PCs, where all contacts must be made by a single appointed "technical coordinator", whom IBM describes as "the client company's resident PC specialist".

The Infosearch service runs on a 43XX mainframe system at IBM's new corporate headquarters at Cumberland Forest in Sydney, and is based on an expandable database which now contains over 4000 questions and answers pertaining to the PC. Users in all State capitals except Hobart will be able to access Infosearch for the cost of a local call.

True to form, IBM pledges in the Infosearch announcement to provide "a response, but not necessarily an answer" to users' questions by the next working day. Information on the database includes details of IBM hardware and software products, hints on how to use them, operating techniques and product news. The range of subjects covered by the database will grow as new products are released.

AWA announces new Corona PC and multi-user system: AWA is upgrading its Corona desktop system from the 325 series to the newer PC-400. The serial numbers here refer to the number of horizontal screen lines produced by each model. Having more lines allows higher-resolution graphic images and also brings the system more into line with the IBM standard of 640 by 200 lines, obtainable on the new Corona by using every second line. Software such as Flight Simulator and Lotus 1-2-3 will run in PC emulation mode.

The bundled software provided with the Corona systems no longer includes the Multimate word processing package, but MS-Dos 2.11, GW-Basic and PC Tutor are still provided. The monitor size has been increased from 12in to 14in, and now includes a tilt and swivel base. The hard disk version of the PC-400 will also include a real-time clock/calendar as standard.

The new Corona PC-400 has more compatible graphics.

AWA has also announced the multi-user Corona Mega-PC, which supports up to eight user workstations, in a similar fashion to the controversial PC Slave system. Each workstation comprises a screen and keyboard linked to a "PC on a card" inside the large Mega-PC housing. This architecture, combined with the 8MHz processing speed of the 8088-2 CPUs on each card, makes the system impressively fast and efficient. Nevertheless, at just over $13,000 for the file server and $3000 for each additional workstation, it is only the larger corporate buyers who would be in the market for such a system. The small business user would probably be more attracted to the $5132 price tag of the PC-400.

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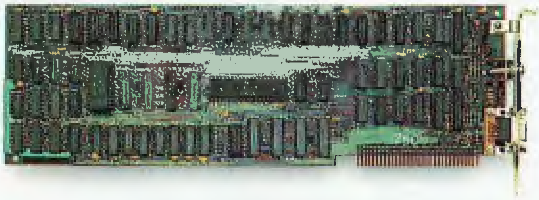

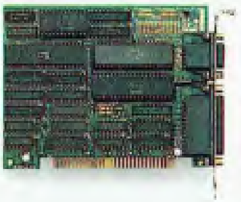

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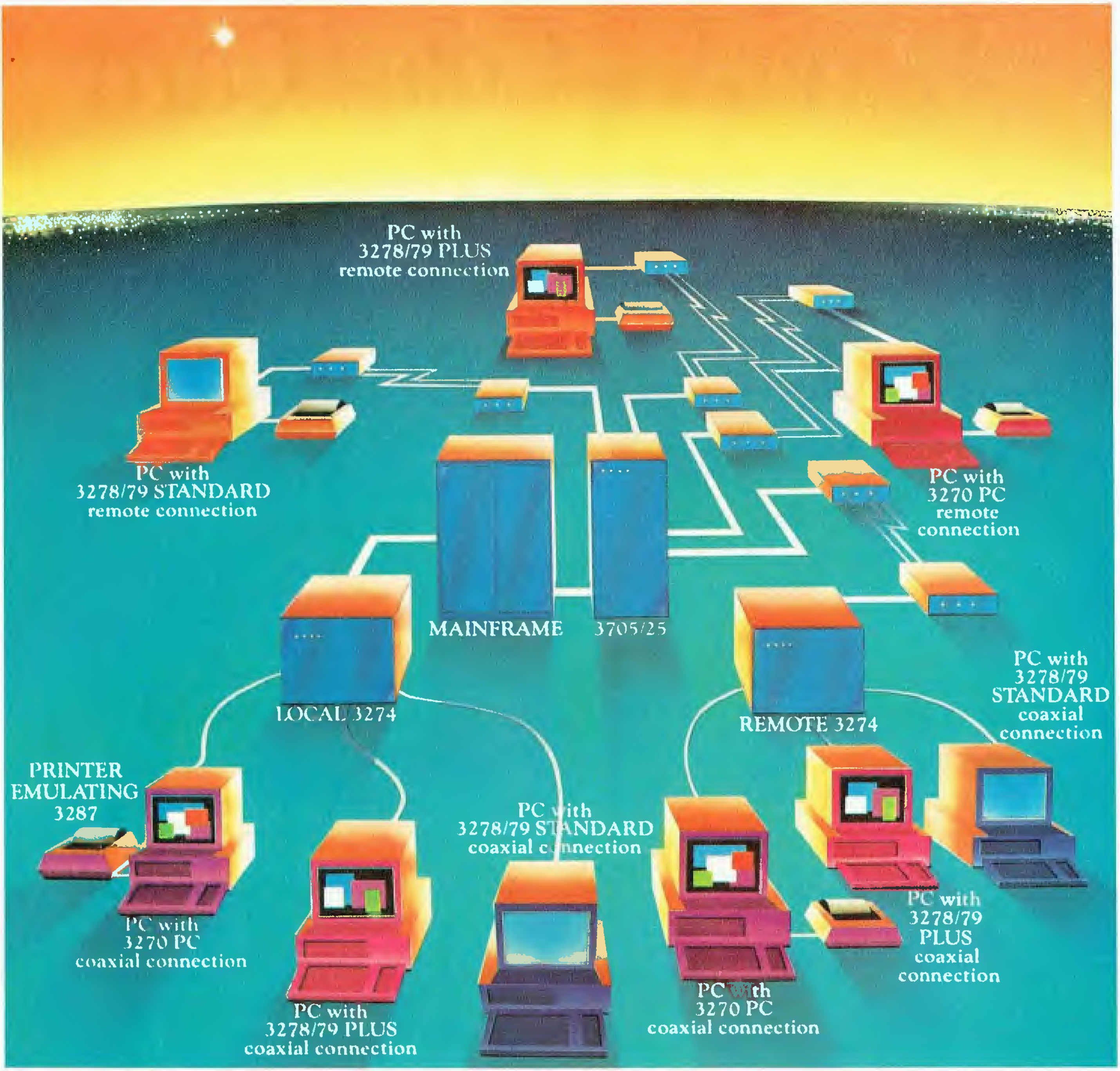

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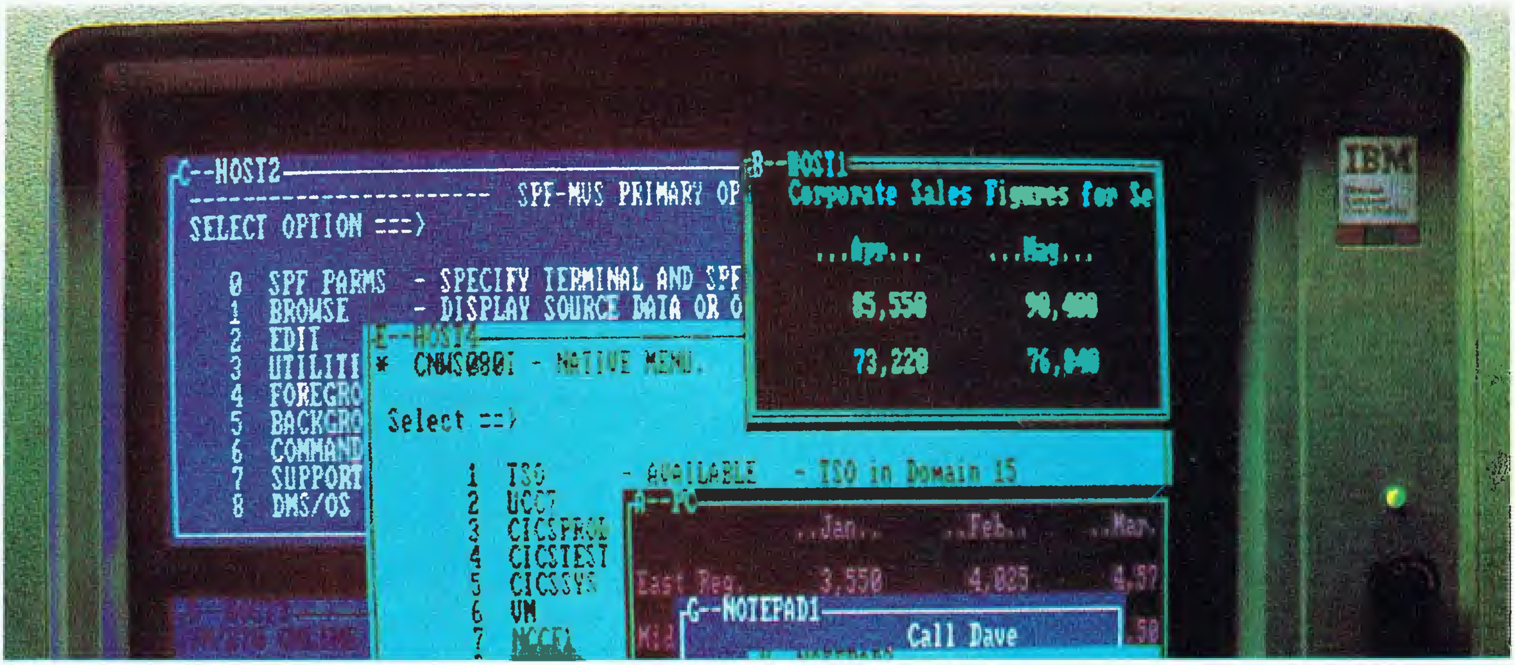

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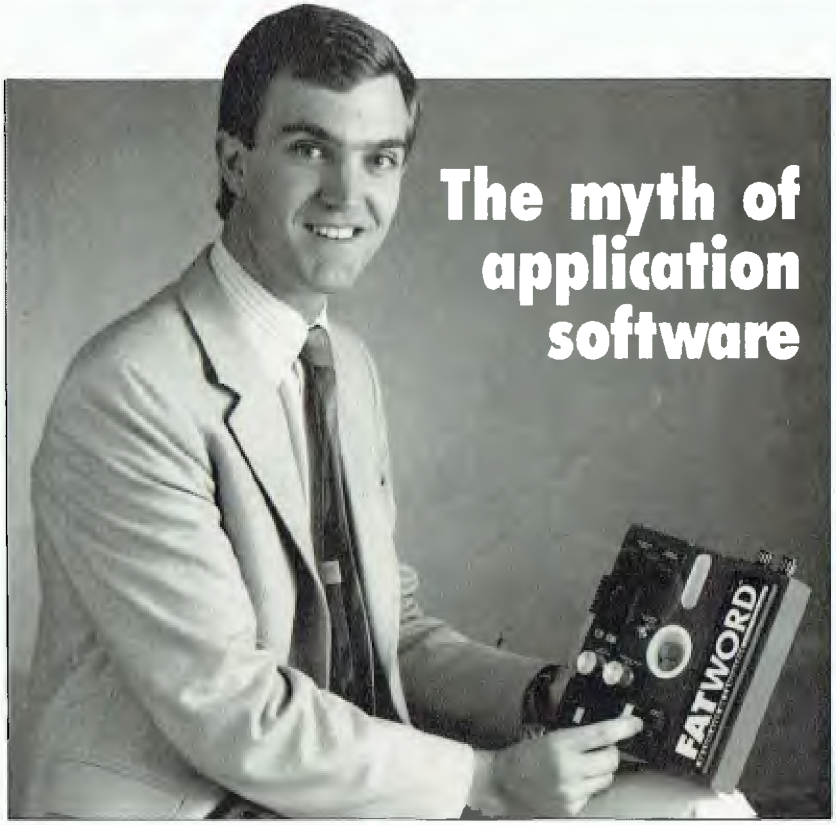
EDITORIAL

IAN ROBINSON



The myth of application software

> *"There is a better way. Find it!"*
>
> *— Thomas Edison*

Despite many advertisers' claims, the mere addition of applications software to PC hardware does not yield the so-called "total solution", even when support, training and warranties are included in the promise (and often they are not).

Although the market has been successfully educated to the extent where the average new PC buyer is now aware that a computer without software is nothing but an empty shell, very few realise that the simple addition of a word processor, spreadsheet or database program (no matter how good) still results in an empty shell.

What many have discovered the hard way is that a great deal of thought and energy must then go into creating the appropriate worksheet, program, model or style sheet for the user's unique environment. Only then does a total solution come into sight.

No matter how many frills, features, bells and whistles are added to updated, improved, enhanced versions of the same old applications software, these programs remain only tools. In other words, booting them up achieves no more than switching on the PC, and is often a great deal more difficult.

Then there is the matter of learning each program's capabilities and coming to grips with its limitations — an often time-consuming and difficult process that must be tackled before the creation of a useful model is possible.

Because each business is different in some way, and because all PC users (past, present and future) have unique ways of performing their work, this final customisation stage will always be required. The advent of expert systems, friendlier user interfaces and "softer" software may make this task less painful, but can never eliminate it altogether.

The best way to tackle the problem of customising applications software is to contact other PC users and to see how they have achieved their own particular total solution. Becoming more involved in the local PC community helps to prevent you from re-inventing the wheel, and is guaranteed to highlight a few handy shortcuts.

The Sydney PC Users Group has taken this concept one step further by organising APCON 85 — a PC applications convention staged by PC users for PC users. Major applications areas such as spreadsheets, databases, word processors and graphics will be covered by guest speakers (many from overseas) and then individual solutions using those applications programs will be demonstrated by user group members.

Although APCON 85 is a non-commercial venture, corporate sponsorship has been sought for equipment and guest speakers. Already, IBM, Microsoft, TNT and Imagineering have confirmed their support for the convention,

APCON 85 represents a golden opportunity to meet PC users who have successfully used applications software to solve a problem, and to see their solutions in action. If you cannot make it to APCON 85, then joining (or starting) a PC user group is the next best thing.

The Australian PC community is undergoing rapid expansion, fuelled by the widespread recognition of how PCs can improve your way of life, and the key to implementing your own total solution successfully is to become involved.

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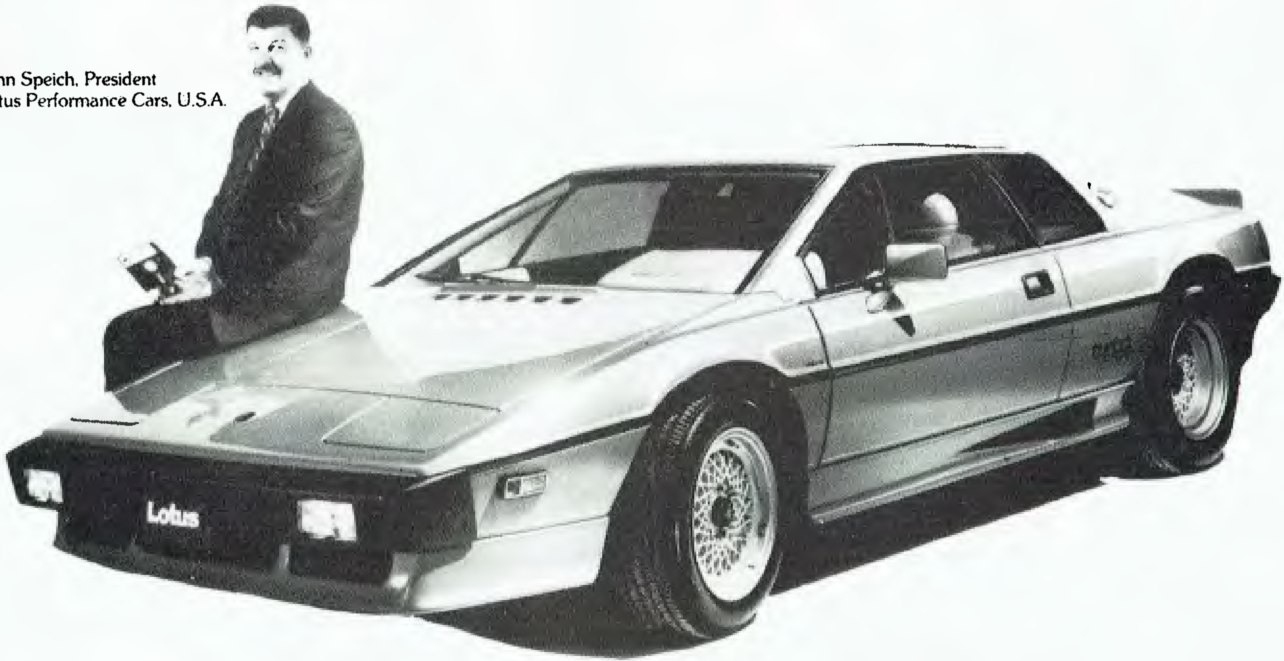

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Lotus came to two conclusions after looking for software. One: a symphony is something you listen to on the highway with the radio turned up loud. And two: Framework may well be all the business software a fast-moving company needs.

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GETTING TO

Database programs for the PC are often advertised as powerhouse packages, although the underlying concepts are quite simple, as David Frankel and Michael Guttman explain.

All organisations and most individuals have to organise information systematically for easy retrieval. Most people keep track of appointments, correspondence, and personal budgets. Businesses need records of inventory, creditors, and customers.

Many software packages for the PC are designed to make record keeping easier. These programs are called database management systems (DBMSs) or database managers. A database is simply information collected on disk. A DBMS is a program that organises and provides easy access to a database.

Before using a DBMS, you need to understand the basic record-keeping concepts common to both manual and computerised systems. A hypothetical example of a manual record-keeping system used in a typical small business will help illustrate these concepts.

Manual system

Imagine you are running the business office of a small retail auto parts store without a computer. You maintain two sets of records: one set contains information on every parts supplier your company does business with; the second set lists the items in your company's inventory. You keep each set of records in a separate file drawer.

The set of supplier records contains a folder for each supplier listing the name, street address, city, State, and area code. You label the folders with the suppliers' names and arrange them alphabetically.

The set of inventory records has one folder for each inventory item. Each folder contains the stock number, a title or description of the item, the quantity in stock, the quantity on order, the cost, the list price, and the supplier's name. The folder is labelled with the stock number, and you arrange the folders in numerical order.

DBMS terminology

The manual record-keeping system just described makes it easy to understand standard data base terminology. In the office each set of records is contained in one file drawer; in a database each set of records is called a file. In this example you have a supplier file and an inventory file.

Each folder in a file drawer is represented in the database by one record. For example, the folder labelled "Amalgamated Auto Supplies" is one of many records in the supplier file.

The information in this record pertains solely to this supplier. Similarly, each database record in the inventory file represents a folder with information about a particular inventory item.

In a database the categories of information in each record are called fields. Each record in a database file has the same fields. For example, each record in the supplier file includes the fields for name, street address, city, State, and area code. The fields for each record in the inventory file are stock number, title, quantity in stock, quantity on order, cost, list price, and supplier's name. Figure 1 illustrates the hierarchy of files, records, and fields.

One field in each file plays a special role.

the purpose of this field, called unique key, is to identify each record unambiguously. The unique key for the supplier file is the supplier's name, because each supplier has a different name. The unique key for the inventory file is the stock number, because only this field precisely identifies each record.

Related files

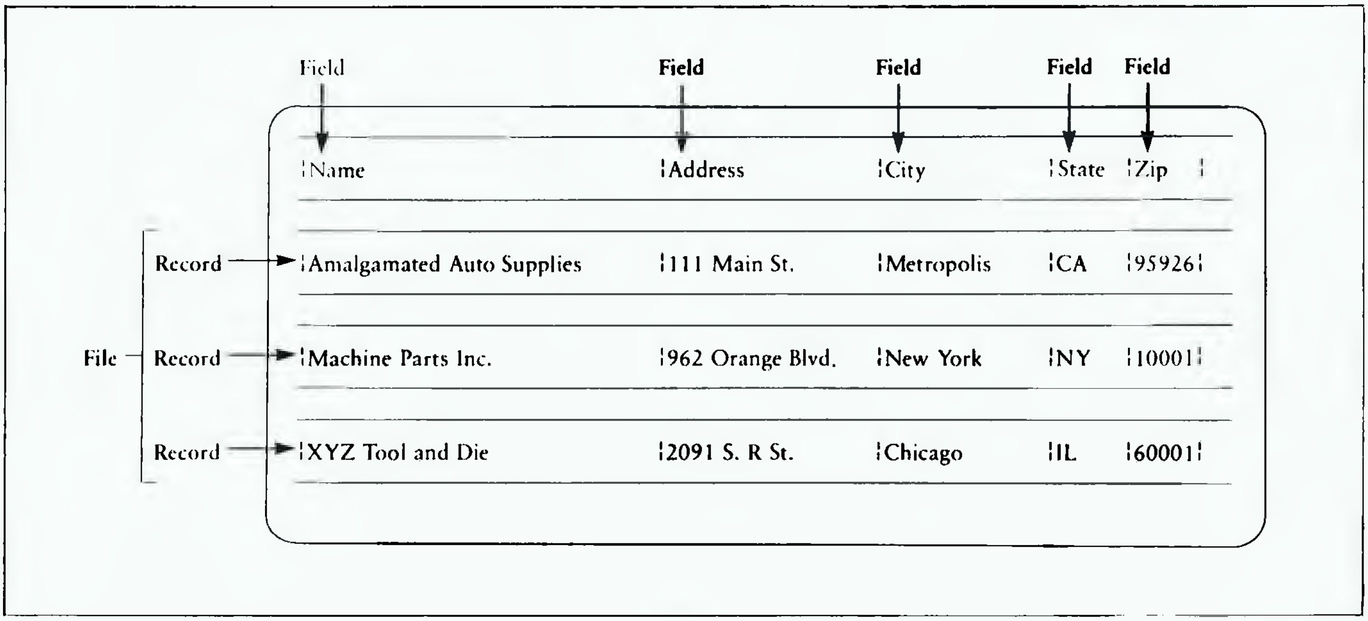
A DBMS avoids repeating information in more than one file whenever possible. Instead, files are related so that you can refer to a secondary file when you require further information on a field in the first file. Although the simplest DBMS software does not allow you to define relationships among files, we will assume the use of a slightly more sophisticated package in our example.

An inventory record contains the field for a supplier's name, but the rest of the information about that supplier is in a record in the supplier file. Because the unique key for the supplier file (supplier's name) is included as a field in the inventory file, the inventory file is said to be related to the supplier file.

Suppose you decide to keep a file of all inventory item purchases. You create a purchases file that contains a record for each purchase that shows the purchase number, the stock number, the quantity purchased, and the date of purchase. In this file the purchase number is the unique key.

Each purchases record need not contain inventory information about the purchased item (such as price or supplier's name) as long as it includes the item's stock number. Since the stock number is the unique key for the inventory file, you can use the purchases file to call on the inventory file if you need more information about an item. Figure 2 illustrates how the supplier file, the inventory file, and the purchases file are related.

A DBMS that uses related files performs other special functions. In the parts store example, when you enter a stock number into a record in the purchases file, the DBMS checks for a record in the inventory file that



Name	Address	City	State	Zip
Amalgamated Auto Supplies	111 Main St.	Metropolis	CA	95926
Machine Parts Inc.	962 Orange Blvd.	New York	NY	10001
XYZ Tool and Die	2091 S. R St.	Chicago	IL	60001

Figure 1: Data files contain a number of records which in turn contain fields.

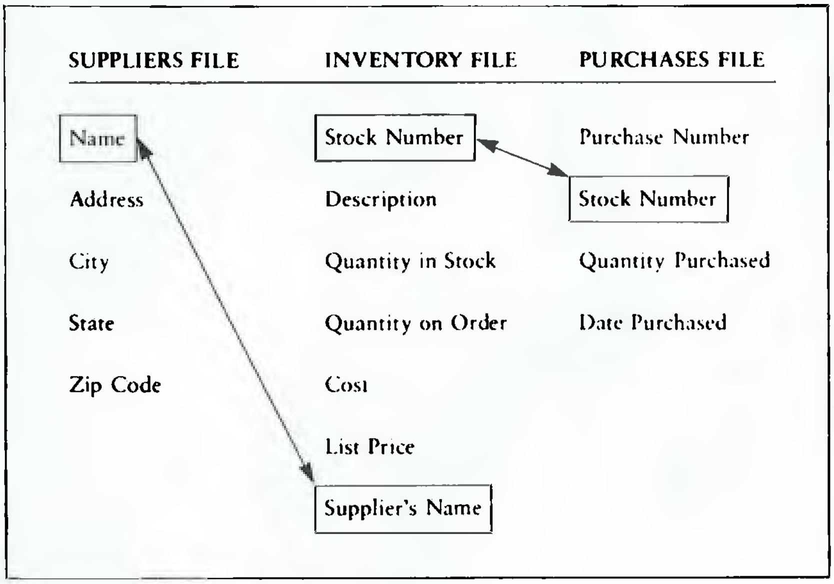


Figure 2: Related files means that a field in one file is the key field for another file.

has that stock number as its unique key. If the number entered is not found in the inventory file, a screen message appears to that effect, asking you to enter the correct number. When the DBMS finds the stock number in the inventory file, you can display other information, such as the description of the item, on the screen.

Designing a database

When using almost any DBMS, whether simple or sophisticated, the first step is to define the files. The DBMS prompts you to supply a title for each file, the maximum number of records it can contain, and its total number of fields.

You then define each field by entering the title, the type, and the maximum length. The title is an identifying name for the field, such as address or stock number. The most common types of fields are numeric, character, logical, and date. A numeric field contains only numeric data, such as quantity or price. A character field, also called an alphanumeric field, can hold any characters — numbers, letters, or other symbols. An address field is an example of a character field. A logical field can be used whenever a simple yes or no answer is sufficient. The field type is important because the DBMS stores each type of data differently.

Specifying the length of a field means choosing the number of digits (whether letters or numbers) the field can hold. To specify the maximum length of a field, decide what the largest piece of data will be for any record in the file. For example, if no address will ever exceed 40 characters for any supplier record, then the maximum length of the address field should be 40.

If you never keep more than 200 of any inventory item in stock, then the maximum length for the quantity-in-stock field should be 3. Careful choice of field lengths will result in the most efficient use of disk space. You do not need to specify the maximum length for the date field because it is always the same.

To finish defining the files, indicate the unique key field for each file. Figure 3 shows typical prompts and responses for defining the attributes of a file.

Once you define the files and fields, you can enter information into the files. When you select the data-entry function, the DBMS prompts you to enter the name of the file that will hold the data. After the video screen clears, a new screen appears that lists the titles of all the fields in that file. Next to each field title is a space, marked by brackets, for entering data. Figure 4 shows a sample data-entry screen completed for the supplier file.

As part of the data-entry function, you may choose to enter new records or to list (display), edit, or delete an existing record. If you are entering a new record, the cursor moves to the space next to the name of the first field. After typing in the data for the first field, you press <Enter>, and the cursor moves to the space next to the name of the second field.

When you have entered information for each of the fields, one record for the file is complete. The spaces for entering data are then cleared, and you repeat the process for the next record.

For each field the DBMS checks that the data entered conforms to the field type. For example, if you enter "Amalgamated Auto Supplies" for the area code, a screen message tells you that the area code is a numeric field. You then have the opportunity to re-enter the area code.

If you choose the list option for an existing record, the cursor moves to the unique-key field. You enter the information that

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Figure 3: Defining a file involves selecting a title, type and length for each field.

```
ENTER FILE NAME      : SUPPLIER FILE
MAXIMUM NO. OF
  RECORDS            : 150
NO. OF FIELDS        : 5

FIELD #1
  TITLE              : NAME
  TYPE               : CHARACTER
  MAXIMUM LENGTH     : 25

FIELD #2
  TITLE              : ADDRESS
  TYPE               : CHARACTER
  MAXIMUM LENGTH     : 15

FIELD #3
  TITLE              : CITY
  TYPE               : CHARACTER
  MAXIMUM LENGTH     : 13

FIELD #4
  TITLE              : STATE
  TYPE               : CHARACTER
  MAXIMUM LENGTH     : 2

FIELD #5
  TITLE              : ZIPCODE
  TYPE               : NUMERIC
  MAXIMUM LENGTH     : 5

WHICH FIELD IS THE UNIQUE KEY? 1
```

identifies the record you want to see. To display an item from the supplier file, for example, you enter the name of the supplier you want. If the DBMS finds the record you have asked for, the information appears in the space next to the field names. A screen message informs you if the DBMS does not find the record.

If you choose to edit the record, a designated key moves the cursor to the field you want to change. After entering the new information, you move the cursor to the next field you want to edit. Pressing another key indicates the editing is complete.

Figure 4: A typical data-entry screen displays the record and provides a menu.

```
                    SUPPLIER FILE

NAME     : AMALGAMATED AUTO SUPPLIES
ADDRESS  : 111 MAIN ST.
CITY     : METROPOLIS
STATE    : CA
ZIPCODE  : 95926

1) ENTER NEW RECORDS
2) LIST RECORD
3) EDIT RECORD
4) DELETE RECORD

ENTER OPTION NUMBER: 1
```

If you select the delete option, a screen prompt asks you to confirm this request. The record is then removed from the file. Think of the data-entry screen as an electronic business form. When entering data you are essentially filling out a form on the screen. A well-designed DBMS should make data entry easy and efficient.

Reports

The DBMS functions described so far would be of little use unless you could easily get an overview of the information you have collected. A report is an overview of a selected portion of data.

The DBMS allows you to specify the portion of the data you want for the report and the format in which it will appear. A screen prompt asks you to give the report a title and to supply the name of the file you wish to view.

You can specify the order in which the records appear on the report by designating a field as the sort key. The sort key can be the unique key or another field. For example, you may want a report from the supplier file that orders the records according to area code. In this case, the area code would be the sort key. You may request that totals for numeric fields appear at the end of the report.

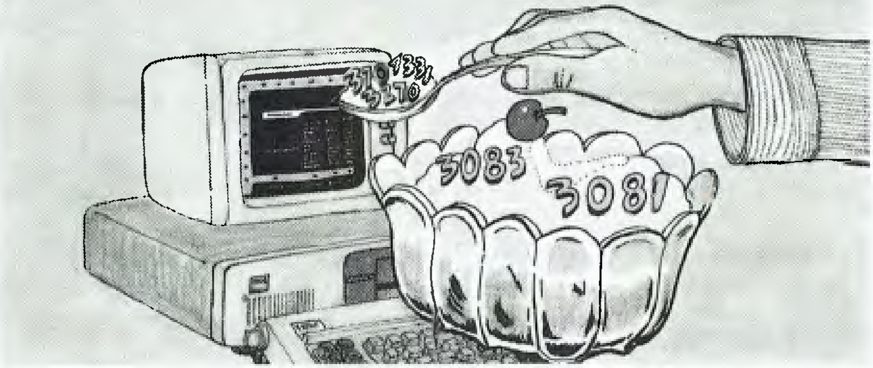
Once you define the report format, you can recall the report by name at any time. A master list is a common type of report that shows all the records contained in a file. The master list is divided into columns, one column for each field.

The names of the fields appear above the columns. Each horizontal line on the report represents one record. Another type of report is a transaction log, which shows the records in a transaction file in much the same way that a master list shows the records in a master file.

As well as defining related files, sophisticated DBMS packages may include the following features:

Index file. For a simple DBMS to produce a master list of an inventory file ordered by stock number (or any other field), it must perform a time-consuming sorting procedure.

How To Delight Your Lotus With Mainframe Data



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Some DBMSs have an indexing feature that eliminates this delay. An index file is an auxiliary file that specifies the order of the records in the main file. The index key is the field from the main file that you select to determine this order.

The index key does not have to be the unique key. For example, a transaction log of purchases could be ordered by date, which is not the unique key for purchases records.

> ***After the PC appeared on the scene, DBMS products became available to everyone. Today these products range from simple, inexpensive packages to more sophisticated costly models.***

Every time a new record is added to the main file, the index file is immediately updated. When you request a report with the records in a particular order, the index file produces the report without any sorting delay.

A DBMS may also allow a main file to have more than one index file. Several fields can serve as index keys to that a file can be reported in a variety or orders, all without the need to sort.

Electronic form. An advanced DBMS offers flexibility for designing electronic data entry forms. You can create forms using a word processor, and you can place field names and spaces for entering data anywhere on the screen. Forms can include instructions and borders, and data can be entered into many files on the same screen.

Report functions. When generating reports, a DBMS can produce sub-totals, show totals and sub-totals without displaying individual records, select subsets of a file for reporting, produce counts of records that fall into certain categories, and perform arithmetic calculations on numeric fields, such as multiplying cost by quantity purchased to produce an extended price column.

A DBMS can also use unique keys to locate information on related files. For example, a transaction log for the purchases file could display an item description from the inventory file for each purchase.

Updating files. Some DBMSs provide a way to update the information in files other than by direct data entry. Returning to the example of the auto parts store, you might want a field in the supplier file called total purchased.

This field records the total dollar value of all purchases made from each supplier. Upon entry of each record to the purchases file, an advanced DBMS can calculate the dollar value of the sale and add that amount to the total purchased field in the supplier record. To calculate the dollar value of the sale, the DBMS multiples the quantity purchased data from the purchases record by the item cost contained in the inventory record.

Menus. Some DBMS systems enable you to construct menus for frequently used procedures. You specify the function to be performed for each menu option. Then instead of having to enter several DBMS commands, you can choose one option to perform the desired procedure.

The changeover

Before the advent of the personal computer, DBMS packages were tools available only to the software houses that developed them. Programmers used DBMSs to produce custom software for their clients. Often these DBMSs were not well integrated and lacked documentation.

Eventually, some software companies realised that general-purpose DBMS programs, carefully integrated and properly documented, were marketable products. These DBMS packages were sold primarily to other software manufacturers or to corporate data processing departments. IBM developed a line of DBMS products for its mainframe computers.

After the PC appeared on the scene, DBMS products became available to everyone. Today these products range from simple, inexpensive packages to more sophisticated, costly models. With a general understanding of DBMS features and capabilities, you are better prepared to make the changeover from manual to computerised data management.

David Frankel and Michael Guttman are partners in a software development company.

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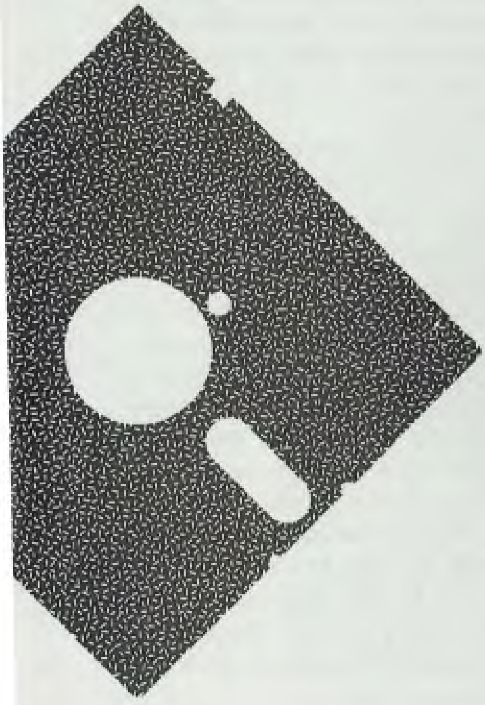
A Patch in Time

Quietly tucked away inside every copy of Dos is DEBUG, an invaluable utility. Alan Hoenig explains.



It is hard to believe, but the time will probably come when you discover that the slick software with which you have outfitted your PC is not perfect. The problem might be an irritating error message or something more serious, like an inability to work with a new peripheral. When that happens, do not panic and do not give up: right within Dos is a program that may give you the power to fix the problem. The Dos utility Debug allows you to customise, or patch, commercial programs that do not suit you. Learning how to make those patches does not take long.

Here is a case in which a patch was necessary. I have a Hercules monochrome display board installed in my PC; recently I tried using the popular MultiMate word processing program, and it would not work. A quick call to MultiMate's publisher revealed that the program seeks hardware connections slightly different from those on my alien (non-IBM) board. Fortunately, the company had already researched the problem and found that making a small patch with Debug solved it. The program was up and running in no time.

Software companies will not always have the right patch at the right time. Fortunately, there are other sources. Patches to streamline the operation of popular software packages can often be found on electronic bulletin boards, at user groups, and in computer magazines. *Australian PC World*, for example, publishes patches in the ★•★ columns.

The language of Debug

Patches are usually implemented by making small changes in the program file, which is coded in machine language. Machine language is based on eight-digit binary numbers called bytes. To make reading these strings of 0s and 1s less confusing, Debug represents these bytes as two-digit hexadecimal numbers. Before you use Debug you must become familiar with the basics of hexadecimal arithmetic.

Our own decimal system uses 10 digits, due to the biological accident that our ancestors had 10 fingers to use as counting tools. A computer works with numbers as if it had 16 fingers, and that hexadecimal system requires 16 digits. To save the sanity of printers and typographers, those digits are given conventional labels, namely 0 to 9, which retain their standard values, and A to F, which represent the decimal values 10 to 15.

You must give addresses, offsets, and some byte values to Debug in hexadecimal form. Debug uses addresses to locate information within a computer's memory, much as Australia Post uses your address to find your house. Each address in Debug is written in two parts. The first part is the *segment address* of the byte: it tells Debug the location of the block of memory, or segment, that holds your program. The second part of the address, separated from the first by a colon, is called the *offset*. It tells how many bytes away from the beginning of the segment the byte is located. For example, an address like 108F:0100 indicates a location 100 bytes into the segment that begins at the location noted as 108F.

When specifying an address for Debug, you generally give only the offset. If you have looked through the Debug instructions in the Dos manual, however, you probably noticed the code *cs:* preceding offset values in some of the command examples. Specifying *cs:* tells Debug to use the value held in the *code segment register* of the computer's 8088 CPU as the segment address. The code segment register holds the segment address of the loaded program. If no segment is specified, most of the commands you use will default to the *data segment register*, which holds the starting address for a loaded data file. For program patchwork, however, specifying *cs:* is not necessary, since with only one file loaded, the data segment register and the code segment register hold the same address.

Debug commands

You will find DEBUG.COM on the supplemental program disk that came with your original Dos package. To patch a file with Debug, start by typing **DEBUG filespec** <Enter> at the A> prompt. The filespec tells Debug the file you want to work with. It can be quite detailed if necessary, including the disk drive designation, the path, the file name, and the extension. If the file DEBUG.COM is not in the default disk drive, you must type the disk drive designation before the word "DEBUG". When you press <Enter>, Debug loads the contents of the file you named into the PC's memory, beginning at offset 100. When you see the hyphen prompt, Debug is ready to accept a command from you.

Debug commands consist of single letters (either uppercase or lowercase), often followed by a series of parameters. You execute a command by typing it and pressing <Enter>. Debug contains many functions and features, but you will need to know only a few to make patches. These are Dump, Search, Enter, Write, and Quit commands, abbreviated to d, s, e, w, and q, respectively. Table 1 shows how each of these commands is used in this article.

The Dump command

You use the Dump command to view the contents of the file you are debugging. Each dump display contains eight lines of 16 bytes each, beginning with the first block in the file, which starts at offset 100. A typical dump appears in Figure 1.

Cmd	Use	Syntax
Dump	To display the contents of the file	d *address*
Enter	To overwrite bytes in the file	e *address list*
Search	To find the text	s *range list*
Write	To write alterations to disk	w
Quit	To quite Debug and return to Dos	q

Table 1: The basic **DEBUG** commands.

The Dump display, like ancient Gaul, is divided into three parts. The left part of the display shows the address of the left-most byte in each row. The middle third of the dump display shows the contents of each byte in that segment. The right third contains an Ascii translation of the bytes. Since not every byte contains information with a printable Ascii equivalent, this section may contain many periods, which represent nonprintable Ascii data. At times nonsensical sequences of recognisable characters will occur because by sheer coincidence a byte contains information that can be converted to Ascii.

If you enter successive Dump (d) commands, Debug obligingly displays successive 128-byte blocks, beginning with the first block or with the block following the last dump display. The Dump command can be followed by an offset address. If you specify an offset, Debug displays the 128 bytes begining at that address.

The Search command

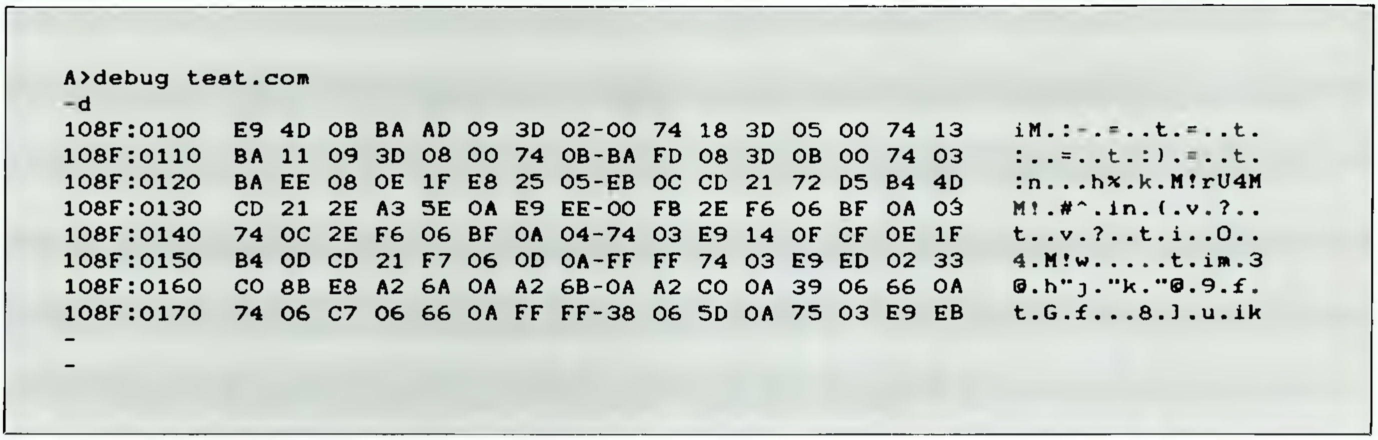
Sometimes you will want to make changes to a byte whose value is known but whose location is not. Somewhere in a file, let us say, is the numerical sequence corresponding to the misspelled word 'compuuer'. The first step in the correction process would be to use Debug's Search command to locate that double u.

The Search command requires the following form:

s *range list*

The range parameter tells Debug the range of bytes to search through for the listed values. To give the range, type the offset of the byte where Debug should begin its search, a space, and the offset of the byte where Debug should end its search. Remember, offsets are expressed in hexadecimal notation, and the lowest possible value is hex 100. Normally, you will search through the whole file, so your starting offset would be 0100. If you know the length of the program file, your ending offset would be the last offset address in the file. If you do not know the length of the file, pick FFFF, the highest legal offset.

Following the range, you need to



```
A>debug teat.com
-d
108F:0100  E9 4D 0B BA AD 09 3D 02-00 74 18 3D 05 00 74 13   iM.:-.=..t.=..t.
108F:0110  BA 11 09 3D 08 00 74 0B-BA FD 08 3D 0B 00 74 03   :..=..t.:).=..t.
108F:0120  BA EE 08 0E 1F E8 25 05-EB 0C CD 21 72 D5 B4 4D   :n...h%.k.M!rU4M
108F:0130  CD 21 2E A3 5E 0A E9 EE-00 FB 2E F6 06 BF 0A 03   M!.#^.in.(.v.?..
108F:0140  74 0C 2E F6 06 BF 0A 04-74 03 E9 14 0F CF 0E 1F   t..v.?..t.i..O..
108F:0150  B4 0D CD 21 F7 06 0D 0A-FF FF 74 03 E9 ED 02 33   4.M!w.....t.im.3
108F:0160  C0 8B E8 A2 6A 0A A2 6B-0A A2 C0 0A 39 06 66 0A   @.h"j."k."@.9.f.
108F:0170  74 06 C7 06 66 0A FF FF-38 06 5D 0A 75 03 E9 EB   t.G.f...8.].u.ik
-
-
```

Figure 1: A typical dump display. Each dump shows 128 bytes.

list the information for which you are searching. You may enter either an Ascii character string surrounded by quotation marks or the hexadecimal values of the bytes.

All hexadecimal values in the command must be separated by spaces; it is good practice to put spaces between all values in a command. For example, to search for *uu*, enter the command

s 0100 ffff "uu".

Since U and u have distinct Ascii values, you could not use

s 01010 fff "UU".

If Debug finds a match, it displays the addresses where the characters appear in the file. You can use this information in a Dump command to see the surrounding information. If no match is found, Debug will display just the hyphen prompt.

The Enter, Write and Quit commands

To make the changes, use the Enter command. With this command you can "poke" particular values into specified locations. The command format is

e *address list*

The *address* parameter is the offset at the beginning of the data you want to replace, and *list* consists of the new values you want to enter, expressed either as hexadecimal values or an Ascii string. If you use an Ascii string, the values must be enclosed in quotation marks. The Enter command overlays as many bytes as necessary to contain the values in your list, starting with the byte at the specified offset. Enter behaves like a word processor in overtype text entry mode. The command

e cs:145 "uter"

would fix the double *u* in *compuuer:* if the first *u* was located at offset 145.

So far, the changes and manipulations you have orchestrated are only on the copy of the data that sits in your computer's memory. To save the changes permanently, you must write the modified file back to the disk with the Write command. The form of this command is simply **w**. If you return to the operating system without using the Write command first, you consign your changes to oblivion.

To return to Dos, enter the short and sweet Quit command: **Q**. Remember, Quit will not automatically save your changes. You must use the Write command first.

Customising COMMAND.COM

For practice, try making a patch to the Dos command processor, COMMAND.COM. Make sure that you work with a copy of this file, not the original. If you destroy the original, you cannot run Dos, and therefore, most of your software.

To start, boot the computer without benefit of an AUTOEXEC.BAT file. If no AUTOEXEC.BAT file is present, Dos will display its sign-on message at start-up. On IBM machines, this message says something like "The IBM Personal Computer DOS Version 3.0 (C)Copyright 1981, 1982, 1983, 1984."

Users of MS-Dos see similar messages. In this exercise, you will learn how to change this message to anything you want — greet yourself with your name, your company name, or anything you would like. The steps of this procedure are illustrated in Figure 2.

Copy DEBUG.COM and COMMAND.COM on to a disk and place that disk in the default disk drive. (This example assumes that A: is the default drive.) Then get things rolling by entering

debug command.com

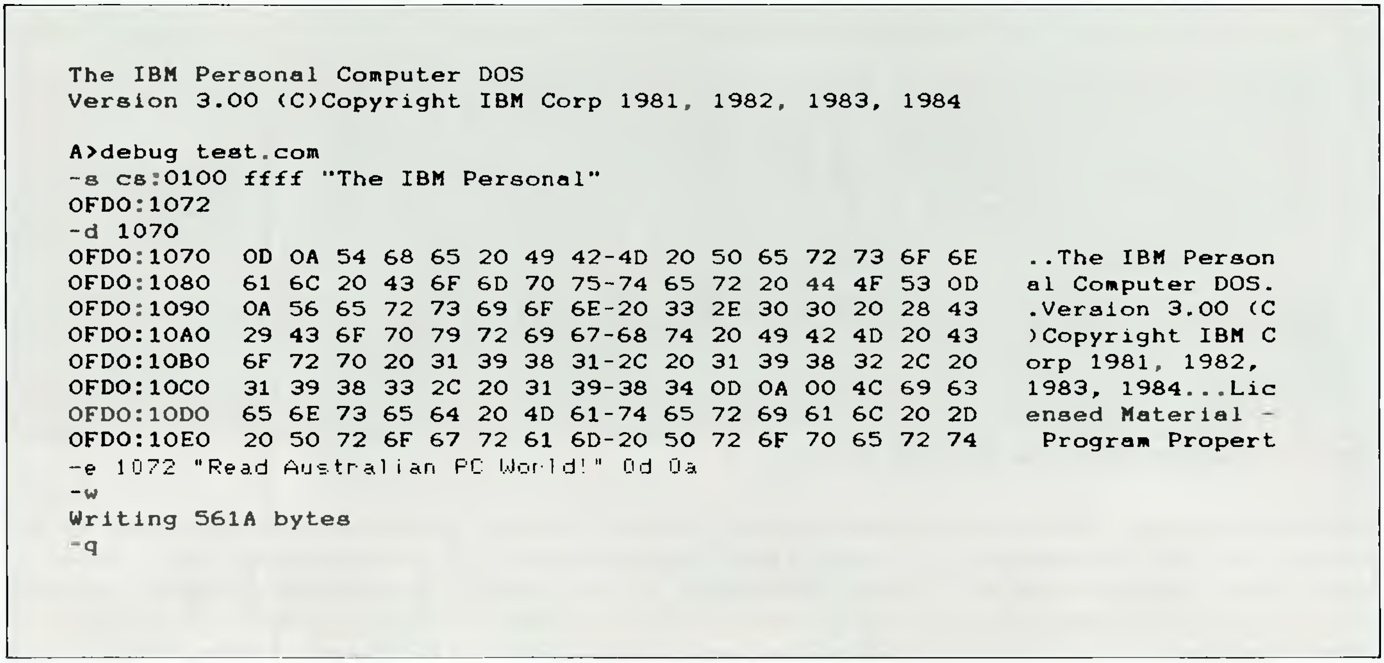
at the A> prompt. Wait for the Debug hyphen prompt.

Your first task is to discover where the text of the standard sign-on message sits in memory. A lazy way is to give the Dump command without parameters until you see the text you need. Press

d <Enter>

a couple of times, keeping your eyes glued to the right side of the screen.

You will see some strange things, but not the message you are looking for. Indeed, the message text occurs



```
The IBM Personal Computer DOS
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A>debug test.com
-s cs:0100 ffff "The IBM Personal"
0FD0:1072
-d 1070
0FD0:1070  0D 0A 54 68 65 20 49 42-4D 20 50 65 72 73 6F 6E   ..The IBM Person
0FD0:1080  61 6C 20 43 6F 6D 70 75-74 65 72 20 44 4F 53 0D   al Computer DOS.
0FD0:1090  0A 56 65 72 73 69 6F 6E-20 33 2E 30 30 20 28 43   .Version 3.00 (C
0FD0:10A0  29 43 6F 70 79 72 69 67-68 74 20 49 42 4D 20 43   )Copyright IBM C
0FD0:10B0  6F 72 70 20 31 39 38 31-2C 20 31 39 38 32 2C 20   orp 1981, 1982,
0FD0:10C0  31 39 38 33 2C 20 31 39-38 34 0D 0A 00 4C 69 63   1983, 1984...Lic
0FD0:10D0  65 6E 73 65 64 20 4D 61-74 65 72 69 61 6C 20 2D   ensed Material -
0FD0:10E0  20 50 72 6F 67 72 61 6D-20 50 72 6F 70 65 72 74    Program Propert
-e 1072 "Read Australian PC World!" 0d 0a
-w
Writing 561A bytes
-q
```

Figure 2: The Debug session during which the Dos sign-on message is changed.

somewhere deep within the file, so dumping the whole file 128 bytes at a time is not the best way to go about it. Searching for the message is faster. You want to search for some distinctive pattern, such as *The IBM Personal*. Enter a command like

s cs:0100 fff "The IBM Personal"

and see what addresses Debug displays.

The exact address of the message string varies depending on the machine and the version of Dos you use, but suppose the address is 0FD0:1072. To see the context of this string, enter a command like

d 1070.

Notice the address is rounded down. That enables you to see some of the bytes preceding the text. If you seek a string located in the middle of the sign-on message, you must carefully count backwared — in hexadecimal — to find the starting offset.

You should see the text of the message embedded in the right grid. Microsoft reserved between 80 and 90 bytes (depending on the version of Dos you are working with) to contain this sign-on message. Each line of the message ends with the byte sequence 0D 0A, which signals Dos to return the cursor to the beginning of the next line. Your own message must not go beyond the final 0D 0A sequence that ends the original message. Indeed, any patch you make cannot take up more bytes than you are replacing. Since the Enter command overwrites the data in the file, it can replace data only on a byte-for-byte basis.

Enter the new message with the command

e cs:1072 "Read Australian PC World!" od oa

or with any words you choose between the quotation marks. The characters you insert lie right on top of part of the original message; the balance of the original message remains. To eliminate the rest of the message, enter a sufficient number of spaces (hex 20) to wipe it out.

The changes you have just made reside only in the computer's memory. To make them permanent, you must use the Write command. Type

w <Enter>.

When this is done, you are free to exit Debug with the command

q <Enter>.

To observe the effect of your work (that is, the new message), reboot the computer.

Debug to grow on

You now know enough about Debug to carry out simple program patches and to customise several features of your software. But Debug's features extend far beyond the basics you have learned here.

For more information about Debug, turn to the Dos manual: there you will find a description of the many Debug commands and their uses. This article should help you understand that documentation. Once you know the basics of hexadecimal notation and how to address bytes in a computer's memory, Debug can give you a degree of control over application and system programs that you never though possible. PC

Alan Hoenig is the author of five books on microcomputers.

If you missed the review of accounting packages in the May/June issue of PC World or if you need more information

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Professor Michael Scriven acted as a beta tester for the prototype Samna Word package. Here he describes his impressions of the final feature-packed product, its strong points and its pitfalls.

SAMNA WORD III *flagship or flotsam?*

In the software navies of the world, Samna Word III Plus is a battleship, heavily gunned and armored, not too fast on its feet but with the power to handle most problems, and quick enough for many purposes. Battleships are very costly entries in the defence budget and have gone out of style partly for that reason: Samna Plus (S+, for short) will set you back a thousand dollars in Australia, if you include the cost of postage and a beer to help you bite the bullet. Let us have a look at what you get for the money.

In addition to a heavily-endowed word processing armament (called Samna Word III if you buy it separately, for $790) S+ also gives you a kind of text database (which they call a wordbase) and a spreadsheet. Not exactly the full strength of a naval task force like Symphony (and half a dozen other "integrated packages"), but there is a little graphics in Samna Word III (box drawing using the cursor as a pen) and a pretty healthy maths capability. Having all this on one ship also makes it more likely that it will be well integrated, since it is hard to sail off in more than one direction and so we have what Samna Corp calls "seamless integration" even if it is only between the limited range of applications in S+.

Installation requirements

Apart from the initial cost, the support systems you need for running a battleship are substantial. In this case, you will need to start with 384K-bytes of Ram if you run Dos 2.0 or 2.1. Since we are all quite likely to be moving up to Dos 3.0 sooner or later, keep in mind that you will have to have 448K-bytes in hand by then, and a bit more if you would like to get some other goodies into Ram like Sidekick or Prokey.

Apart from memory, you would need a graphics board if you want to use the nice "zoom" capability which gives you a quick look at a half-scale view of a complete page.

If you are not up for that cost, it may be a consolation to know that the screen on a non-graphics equipped machine will show underlining, which it would not if you do have the graphics board.

It will not have escaped your eagle eye that the number 384K-bytes is larger than 320K-bytes, the maximum number of characters you can fit on a formatted diskette, which means that we peasants are into the unattractive business of having to use two floppies to load the program while saving our pennies for a hard disk. Actually, the news is worse because S+ would not read a clock-calendar card so you have to load Dos first, to get the right time and date into the machine, then load the sequence of disks that gets S+ started. Of course, the dictionary check will use another one.

More Samna features

But there are many other good things to mention, for you feature fiends. To start with, there are the heavy guns: these include mail merge, boilerplate assembly, some macro capability (specifically, user-defined command strings can be attached to the ten numeric keys on the main keyboard), automatic footnote insertion and numbering, an automatic indexer and table of contents generator, and an 80,000 word spelling dictionary.

The lighter armament, (often all you need for a limited war) is also impressive. It includes an alternate keyboards command that brings up a wide range of choices, with the screen showing Greek, Norwegian, and maths scientific symbols, among others. (Even though the program is willing you have to make sure that the printer is not weak.)

There is good column editing, including "snaking", which Samna calls "newspaper columns" — that is, text runs on from the bottom of one column to the top of the second. You can print all or part of a document/page without having to create a print file. There is automatic backup, if you want it. Proportional print is supported and you can set up line spacing in the usual units or in any number of eighths of an inch. Color is supported; and so is "typewriter mode" — typing straight to the printer, useful for envelopes and sometimes for forms. Double underline is easily implemented, but you will need to be sure about your printer — my Thinkjet jumped a line space with fright (it is not in the rather-too-short list of specifically supported printers, and was running as an Epson MX clone, which is only approximately true). You can have two windows on the screen, with two parts of the same document or parts of two different documents showing. Files can be translated into Ascii for transmission over the wire. Vertical as well as horizontal centring of text is available (useful for title pages of reports, for example).

It goes (almost) without saying that S+ gives you all the basic capabilities of any medium-to-top-bracket program; virtually unlimited format changes within a document, decimal alignment, and so on. Furthermore in the category of what any top of the line program should provide but often does not, there is excellent support in the way of a hotline, good reference manuals, a newsletter and a good upgrading policy

Command structure

So what is the bad news? The bad news is that a good conceptual design of the basic word processing functions is seriously flawed at the level of execution. To get a sense of what the conceptual design is, let us begin with a rather nice feature of S+ — the relatively clean keyboard. Unlike Multimate, for example, there is one function listed on

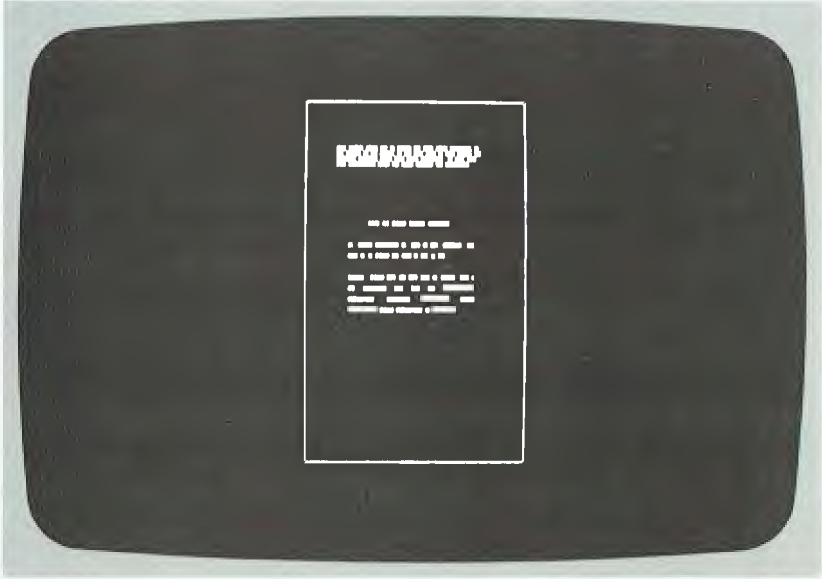


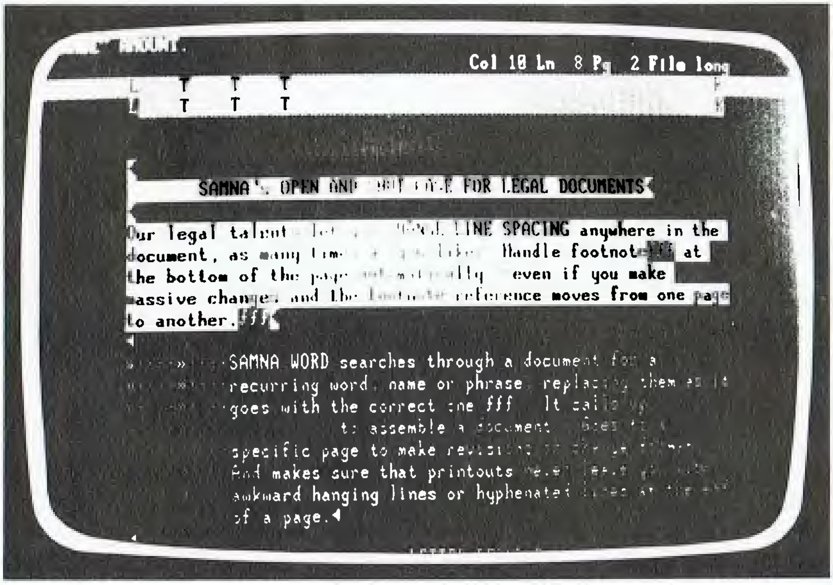
Figure 1: Samna's 'Zoom' feature allows previewing of the shape of the final document.

the template — (and on the stick-on-keycaps) — for each key. There is a slight, but not fatal catch. Four of the keys kick in subsidiary command trees, and it is not always intuitively obvious which of them to use for which commands.

These four keys are labelled Do, Select, Control and Mark. Which of those would you use to invoke the table of contents capability, for example? The answer is Select. What about the title for the table of contents? Try Mark. Well you would come to learn these tricky ones, and almost all commands fit rather obviously under only one of the keys. This is a much better approach than forcing you into long menus for everthing (Displaywrite), or sending you on a key-cap search for everything. Where you are in any doubt, the online Help menu (with a dedicated key to fetch it) will give you the options — thirty of them on the Mark menu. So far, no real black marks; what we have here is one of the better conceptual designs of a word processing system.

The situation deteriorates slightly when we start looking at something more detailed — the cursor and block define commands. The picture is by no means all bad; you can jump to the left or right margin and by character, word, line, sentence, paragraph, screen, page and file — and you can do this forward or backward. Furthermore, there is rather nice GO TO key (the 5 key in the middle of the cursor/number keypad) which gives you a fast Go To Page N, or a (not so fast) trip to any character string, or to a non-printing text placemarker. What more could a user want?

Figure 2: Samna will display bold print and underlining on the display screen.



Col 10 Ln 8 Pg 2 File lon

SAMNA'S OPEN AND [illegible] FOR LEGAL DOCUMENTS

Our legal talent [illegible] LINE SPACING anywhere in the document, as many [illegible] Handle footnot[illegible] at the bottom of the [illegible] even if you make massive changes and the [illegible] reference moves from one page to another. fff

SAMNA WORD searches through a document for a recurring word, name or phrase, replac[illegible] goes with the correct one fff It [illegible] to assemble a document [illegible] specific page to make revisi[illegible] And makes sure that printouts [illegible] awkward hanging lines or hyphenate[illegible] of a page.

Inevitably, a speed deficit turns up all over the place: in searching, repaginating, spelling check, block move and so on. Samna went for writing much of the program in Basic, originally to facilitate portability to other computers. My impression is that they have rewritten some of it into assembly language (perhaps the cursor controls), but that does not include the reformatting routines. Of course, to say that the delay is intolerable does not mean that Samna could not be tolerated by someone who knew no better; it is much better than no word processor at all, or than many of the worst ones. But is is not tolerable to anyone familiar with the best of the bunch (at the moment that would be Word Perfect 4.0 or XyWrite III) or someone who has become used to a competent monster like Wordstar, which is no speed demon until you compare it with Samna in this respect, (Wordstar 2000 is less favorable by comparison).

The second aspect of text adjustment that you would not like is not a speed problem, but illustrates the glitches in the detailed implementation of this design. One aspect of it was mentioned earlier — spaces obtained by the use of Backspace Delete are not filled by the reformatting process. If you accidentally put in an extra return, for example, and then Backspace it out, the symbol vanishes but the extra linespace remains; the same is true when you delete a string of characters of any length. Why not handle this by using the real Delete key? Because it always takes an extra keystroke, because it is an unnecessary change in standard patterns of use and because the Backspace key does wipe text and command symbols off the screen — that is, it deletes in the most obvious sense. So the reformatting is not only slow, but it does not do the job that needs doing with blank spaces. Unfortunately, this is true not only when spaces are created using the Backspace key; if a long word wraps, and you break up the part that wraps around into two shorter words, something that actually occurs quite

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often, the first of these words cannot be forced back to fill the large space on the previous line.

Which brings us to the third type of major problem with Samna, the only one where I would try to fault the conceptual design. S+ suffers badly from the weakness of the whole Wang approach to word processing in that it uses the "overwrite default" approach instead of "insert default"; this means that if you want to edit in a paragraph break or a comma, for example, it takes three keystrokes instead of one. And you get into problems because you cannot insert into inserts on Wangalikes — no problem if insert is the default condition. Nor can you use the cursor up and down arrows, or the cursor jump keys. The assumption is that all inserts are very short, because you cannot even get back to the previous line in a two-line insert.

There are associated irritations; the Sentence Jump only recognises double spacing as sentence endings, which is annoying for the many speed typists who use single spaces after full stops.

Serious omissions

Let us change the subject, though we cannot very well change the drift of the argument. What is missing from Samna? One of the few capabilities in word processing programs that users swear they will never go without is an Undo function, and Samna does not have one. But the worst omission is a decent directory structure.

The one in Samna is from the dark ages. It does not alphabetise, it does not give file size, it does not give last revision date or a note about contents, it uses dot extensions, and it does not even give disk space remaining. Presumably you have to go to Dos for that and remember that means mounting a disk that has Dos on it, which your operating disk does not, using Dos, then reloading the whole of Samna from its two diskettes. Nice that you can do copies and delete files from the directory, but potentially disastrous that you cannot make disk back-up copies that way without mastering Dos terminology, nor can you find out if you are in danger of overfilling the disk. Since the machine optionally makes automatic back-up files you may be eating up disk space at twice the normal pace.

There are a number of other things one could wish for; support for more printers and/or support for more than one printer at a time. Both of these are capabilities found on many word processing programs. And so on. One could live with the omissions, if it were not for the price, and certainly one could live with the one basic design complaint, the use of default overwrite. But add the glitches and the speed problems, and we have answered the question about why Samna does not go to the top of the class.

The combination of the "working blind" approach to the directories with the glacial process of reformatting/searching/moving text (and a dozen other little niggles like the failure to have the current filename appear as the default on the print menu) forces one to wonder whether the head of the present design team is really familiar with the leading competitors. That means having used them for a couple of hundred hours.

It is still too common to find word processing design groups headed by engineers instead of evaluators, that is, they are headed by experts on how to get a system to do things rather than by experts on what the system has to do. Most people would still think that makes sense. But if the how-to expert is in charge, who is to set and modify the exact goals, and monitor the extent to which they have been achieved? Someone who is more impressed by programming problems than by operator problems? That is putting the cart before the horse.

Extra features and training

The spelling checker is so slow as to be almost useless for busy people, and it has other peculiarities. For example, the English dictionary version would not run at all, a problem that will surely be fixed; but the US one also locked up after a spelling pass. Use of the double hyphen for a dash is not recognised (so the program always marks the words connected by the dash as misspelt), though it is faster than the space-hyphen-space version. Both conventions should surely be allowable. A full-stop after a word gets included in it. And so on.

It should also be mentioned that the documentation includes a disk-based installation routine which is locked up and has no hard copy backup; a training disk which has some fairly serious problems, such as hanging up at various points (around lesson 50, however), and not allowing you to skip sections. The Help facility would help you if you can describe what you want to do, but do not know which keys will do it; Microsoft Word and Wordperfect, among others, have solved that problem.

Minor problems

Suppose you want to jump to the end of the text on a particular line or to the end of the text in the document. Here you are in serious trouble. The "jump to right margin" takes you much too far if the line is incomplete, and if the line happens to be full so that you do land on the last character, it would not let you space to the right to add something. If you must insert something at the end of this line (the most likely reason you wanted to jump to the end of the line in the first place) you will find that Insert opens up a space just before the last character on the line, not at all what you wanted.

So how do you insert something at the end of the text in a full line? You could try using Line jump, which gets you to the first character of the next line, and then use Insert; but that would not work if what you wanted to insert was a punctuation mark, because it would not wrap back up to the previous line, and will print out after the space which has automatically been inserted at the end of the line. You have to use Jump to Margin plus Delete the last character, plus Insert it again with the comma after it; slow and untidy, compared with what it should have been.

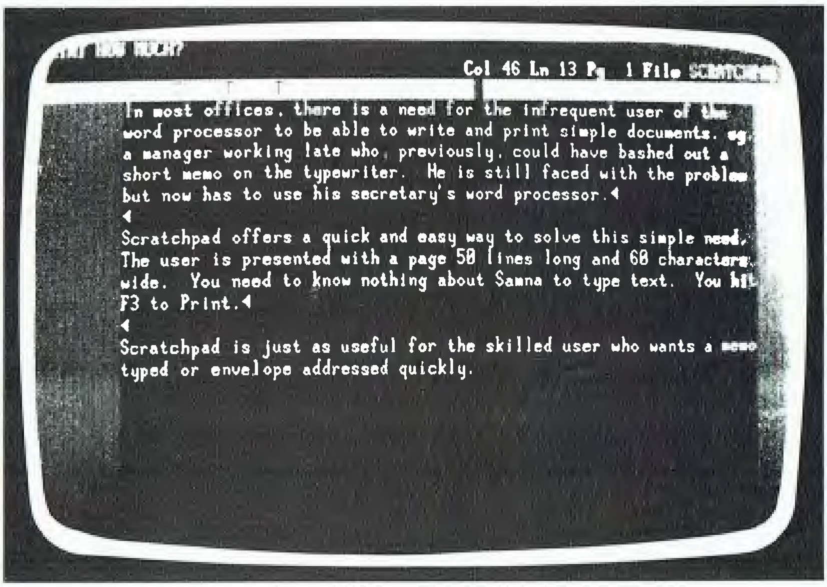
The same kind of irritating problem comes up when you try jumping back to the end of a document which you are in the process of creating, after going into the document to do some editing. In spite of that mightly arsenal of cursor keys, you cannot get to the exact end. There are various approximations, like Jump to End of File which seems like a natural except that it adds one and sometimes two spaces what you did not have before, which is not only confusing, but sometimes throws you off by a whole line.

If you used Paragraph Jump or Sentence Jump to get back to the end of text, they will always take you one line too far, and Backspace from there (remember, the cursor would not backwrap) will get you back on the right line at the cost of taking out the last character you typed. Now that is what I call untidy, inconvenient and inconsistent.

There are associated irritations; the Sentence jump only recognises double spaces as sentence endings, which is annoying for the many speed typists who use single spaces after full stops; at least a settable default option should be allowed. It is no harder to find a full stop followed by a space than two spaces; you can refine the search routine to include a following capital if there are too many false positives.

But perhaps you feel these little nuisances would not worry you too much, and you like the list of features? I like the list too, and the inconveniences are not so serious that I would not put S+ in the top half dozen of the 100-plus word processing programs for the PC. Maybe you cannot get to the exact end of text, but you have a one-key jump to

Figure 3: The Samna command line displays line, column, page and file details.



```
                                     Col 46 Ln 13 P  1 File
In most offices, there is a need for the infrequent user of the
word processor to be able to write and print simple documents. eg.
a manager working late who, previously, could have bashed out a
short memo on the typewriter.  He is still faced with the problem
but now has to use his secretary's word processor.◄
◄
Scratchpad offers a quick and easy way to solve this simple need.
The user is presented with a page 50 lines long and 60 characters
wide.  You need to know nothing about Samna to type text.  You hit
F3 to Print.◄
◄
Scratchpad is just as useful for the skilled user who wants a memo
typed or envelope addressed quickly.
```

end of file that puts you close, and that is more than you can say for most programs. Nobody's perfect, even word processors which call themselves perfect. So why not put Samna at the very top of the list?

The big problems

There are four big problems. The first is glitches: the example just given is multiplied too often and the total inconvenience eventually breaks down your enthusiasm. A couple of years ago, Samna Corp was kind enough to put me on its beta-test panel (last round of field testing) for what was then Samna II. At that time, I felt that the program was one of the best-designed ones available, but had been spoilt by bad implementation programming.

Very significant changes have occurred since then, as well as enhancements, and some aspects of the programming are truly exemplary — for instance, cursor speed and the way you can accelerate it by holding down the Word Jump key seem ideal to me. But there are still too many minor weaknesses in the design like the ones just discussed, plus, for example, the impossibility of getting a repagination done except by printing (or doing it manually) the approach to hyphenation (you cannot insert discretionary hyphens yourself and the ones the program inserts evaporate after one use), a dozen bugs in the tutorials and an overall crash rate of six during this review, though it is hard to say how much of that was due to the program.

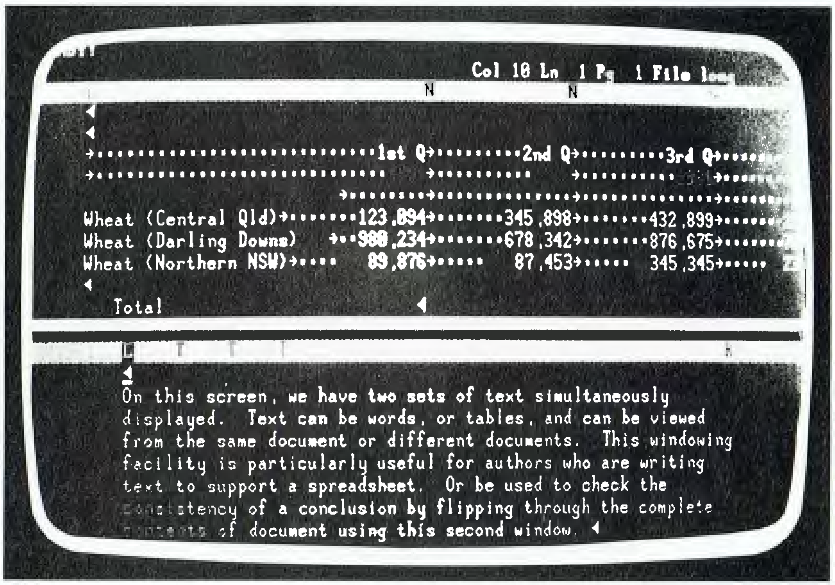


Figure 4: Samna Word allows simultaneous viewing of two windows, from the same or from different files.

```
                                        Col 10 Ln  1 Pg  1 File
                          N         N
◄
◄
→·························1st Q→·········2nd Q→·········3rd Q→·····
→·························       →·········       →·········   →·····
                           →·········→··················→················→·····
Wheat (Central Qld)→·······123,894→·······345,898→·······432,899→······
Wheat (Darling Downs)   →··988,234→·······678,342→·······876,675→·······
Wheat (Northern NSW)→·····   89,876→·····   87,453→·····  345,345→·····
◄
   Total              ◄
```

```
◄
On this screen, we have two sets of text simultaneously
displayed.  Text can be words, or tables, and can be viewed
from the same document or different documents.  This windowing
facility is particularly useful for authors who are writing
text to support a spreadsheet.  Or be used to check the
consistency of a conclusion by flipping through the complete
contents of document using this second window. ◄
```

The second problem is speed on certain tasks. The third problem is one weakness in the overall design. And the fourth problem, surprising enough in view of the range of ordnance available, is serious omissions. To illustrate the speed problem, let us look at what happens after adding or deleting text.

There are really two aspects of text readjustment that you would not like, of which the speed problem is only one. Both show that the implemention programming is still very unsatisfactory. The general approach to reformatting is sensible enough. It calls for massaging only the paragraph you have just changed, not the whole document and not just the affected lines. That is the course of prudence for the PC family, because the processor is not fast enough to do more. But the way it is done is poor.

Suppose you want to delete a word and replace it with another, a common editing requirement. You make the deletion, which can be done as fast as on any program. Now what happens? First, the cursor takes off on a trip down the paragraph line by line, not very fast, to reformat it in the light of the deletion (this is while you are waiting to put in the right word). If the passage you deleted spans more than one line, even if it is only two words, it will be deleted line by line — the whole cursor down and up trip repeated for each part-line. When the cursor does get back and you make your insertion, it goes through the whole performance again. Only then can you get back to work at the end of the text. It feels as if the cursor speed is about one line a second, though in fact it is faster than that. Certainly, you can count fast enough to keep up with it, and if it makes six trips through a 20-line paragraph for you to replace one sentence with another, you are going to get pretty irritated if you are on your own payroll. It is relatively easy for word processor designers to avoid this kind of nonsense. One way is to hold the reformat step after a deletion in case there is going to be an insertion at the same point.

Before starting on some specific comments on spreadsheet and wordbase we need to think about the position of a possible purchaser; it will greatly reduce the amount of detail we have to include. There are, I think, only four cases that need to be distinguished. (Note: a wordbase is something more than an automatic indexer and something less than a good text database.) Case 1: you are looking for a package which only has to have word processing, wordbase and spreadsheet. Case 2: you are looking for a word processor and would not mind picking up the others as a bonus. Case 3: you are looking for a spreadsheet. Case 4: you are looking for a wordbase. Case 3 and 4 you can ignore, since you cannot buy these components of S+ separately. That eliminates the need for detailed separate review of those elements.

Case 1. You want a slim package. How does this combination of word processing, spreadsheet and wordbase compare with the better alternative? The wordbase and spreadsheet are competent but not as good as the best of the opposition, which of course is the relevant comparision when you are up in the thousand dollar area. For that kind of money you can buy Microsoft's Multiplan (a good bet for the best spreadsheet) and Microsoft Word 2, another Top Ten word processing package (on balance the equal of Samna), and Notebook 2, which is probably the best of the PC text databases. You will get "seamless integration" on the first two, which is where you need it (except that Samna copyrighted the term), and you will get better performance on two out of three.

Case 2. If, on the other hand, you would primarily like to get the best word processing that has good support in Australia, Wordperfect is probably your best bet, and you can combine this with the best spreadsheet (Multiplan or Supercalc 3?) and take a slight loss in seamlessness; add Notebook or Microsoft File if you feel like it. Even the best of the word processors in the packages (probably the one in Framework) is not in the league we are talking about here. Forget the Symphony one.

You would not be in trouble with the spreadsheet for occasional use. But if you are really serious about spreadsheets you may feel that the time spent on making a design into a mature product, like Multiplan, the refinement time, has yet to be spent on S+'s spreadsheet. One notices this in connection with the handling of interactive calculations and linked spreadsheets, for example.

Again, you may feel that a maximum size of 64 columns and 100 rows is limiting. In short, while it is a very good opening effort, it is not particularly original and it seems to me, now used to getting around spreadsheets on mouseback, hard to get enthusiastic about and impossible to argue for any intrinsic (overall) superiority to Multiplan.

Which leaves us with the difference in levels of support, where the continued existence of Microsoft is a much better bet than that of Samna Corp (not that I have any specific reason to think that Samna is in trouble). With the far larger user base, this means that chances of upgrades and supplementary packages, and the appearance of useful materials like templates for special applications, is much better with Multiplan (and not bad with Supercalc).

One very important capability that you would like to have in a wordbase is the ability to search all the files on a disk, and here one would expect Samna's speed problems to become serious. So it is exciting to read that a whole disk can be searched in less than a minute. But this is because the search is of directories for keywords, the words you have chosen to have indexed, and we are to assume that you do not splurge on the list.

Conclusions

This is a battleship, and it steams right along, firing some very heavy duty ordnance. It is no canoe, like quite a few of the word processors that come out on top when you do a "beginners-oriented" type of evaluation (PFS:write would be an example). No one should make fun of the designers of something this vast in scale and sufficiently effective in execution to be ahead of almost anything we had for the PC until fairly recently. But there is no point in fooling oneself or others about the problems.

It is pathetic that reviewers will still respond to Samna III with words like these, from a recent Australian computer magazine review: ". . . has all the advantages of a dedicated machine without the price tag".

You really could not sell this program to someone used to one of the better dedicated machines — NBI 4000S or Xerox 860 or Displaywriter or Textpack 6, for example, except for the price, and they would not like the change.

What are they supposed to do with the word "Dos" that not only recurs in the handbooks (despite the claim in the same booklets that you do not need to understand computerese) but represents their only path to information about disk space? What about "pathname"? They are just not used to that kind of rough language. Yet they are used to better performance. Bear in mind that the NBI, for example, runs on an itty-bitty 8-bit processor with 64K-bytes of memory, yet it simply does not have the speed and design limitations of this program running on a 16-bit processor, with 512K-bytes of memory.

Reviewers like the one quoted, the kind who think that Displaywrite 3 is the equivalent of Textpack 6 on the Displaywriter (of course I know that is what IBM says it is equivalent to), set the still-too-low standards of the PC marketplace.

Could we remedy the deficiencies of the program with add-ons? You could certainly improve the interface with something like Gem, converting the file handling to Mac levels of ease, and hiding Dos a little deeper. Now suppose you add 4M-bytes using Above Board. It would not help with the speed problem, because search/reformat speed does not go up with extra memory. You cannot fix the errors in cursor function design with macros or Prokey approaches (a fix that works fine with many word processors that have small design weaknesses), because the speed gets in the way of running the macro. What about going to the AT? It is only 25 per cent faster in clock speed than the standard machine, so the gains from that source certainly are not enough. What about the AT clones with the optional 8MHz rate? Better. Reports that the AT is running programs about three times faster except for disk access suggest that the extra processor power might get us into the right ballpark. A certain fix is machine language rewriting of parts of the program, and maybe they are already doing this, preparatory to releasing an AT version. Let us hope.

To sum up, the heart of this package is a word processor and a spreadsheet (the textbase is a bonus) and so we should compare it with other packages of word processor and spreadsheet. Against the Microsoft combination, it is significantly but not vastly inferior on performance, taking into account the speed problem and various irritating features, but it is seriously overpriced especially in view of the discrepancy in manufacturer instability.

Against the best of the word processors, plus Multiplan, Lotus 1-2-3 or Supercalc 3, it loses more on the word processing that it gains on the integration, so it does less well. There is not a huge difference in the spreadsheets except for specialist uses, so the key variable in the evaluation is the word processing, and the most significant fact about the word processing is the room for improvement in all of these word processors by comparision with what is possible on the PC with 384K-bytes. On a scale of 10, where 10 represents the best that could be done with good programming, Samna would still only get an 8 (which is about what the NBI 4000S would get).

This suggests the interesting conclusion that if Samna had put the thousands of hours of programming time into improving Word III that they put into adding the spreadsheet, they could have had a world-beater complete with fluid scroll, auto-hyphenation, editrace (the huge legal market at your feet from that one capability) and other goodies — and no glitches. Not too hard to get a 9 or even a 9.5, with these resources.

Instead, they read the market as going the Lotus 1-2-3 way, and played follow-the-leader, achieving a small slice of both instead of what might well have been a big slice of what is by far the biggest market, which is still word processing. Users, and reviewers, should give clear signs that they value a relentless press for quality and true performance, and we may then get what we deserve. In Samna Plus, we have much of quality, much performance — but still one cannot help feeling that near enough is not quite good enough. PC

Michael Scriven is a Professor of Education at the University of Western Australia.

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Breakthrough
SOFTWARE

WORDSTAR 2000 VS WORD 2.0

features overkill?

The two new word processors from Micropro and Microsoft are laden with features — perhaps even over-laden. Les Stein compares the two.

Both Microsoft Word 2.0 and WordStar 2000 are exceptional programs, representing consummate programming skills. They differ greatly in their design characteristics but are similar in the range of features offered.

I used the latest version of Microsoft Word (2.0) for this review and the copy-protected version of WordStar 2000. (MicroPro has since dropped this cumbersome copy protection scheme, which may, although I doubt it, make some marginal speed differences.) Word is copy-protected with a simpler scheme that allows it to be started directly from a hard disk.

The Word-mouse philosophy

Microsoft Word attempts to be all things to all people and consequently it lacks a predominant design consideration. Perhaps its main characteristic is that it provides an eclectic range of tools to control the format of a document.

Text in Word is "selected" (marked) in order to be manipulated. Text can be selected by character, word, line, paragraph, document or division, which represents an arbitrary part of a document chosen for particular treatment. Once selected, text can be moved, copied, deleted, enhanced by underlining, boldface and the like, reformatted to fit new margins and line spacing or formatted according to pre-set styles.

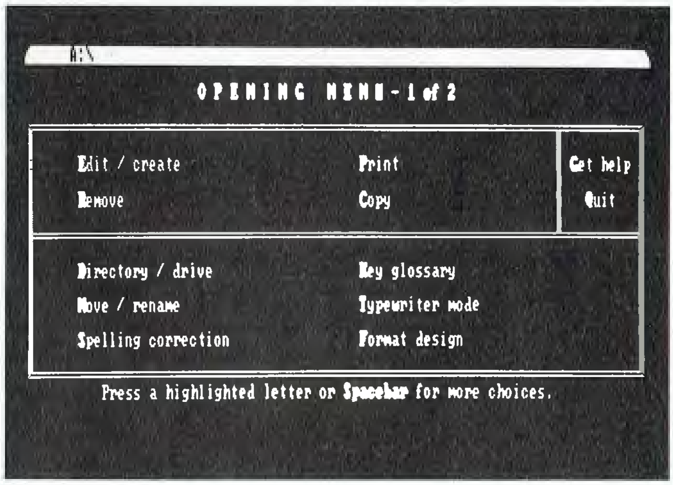
Word was the first word processing package to make use of a mouse as a pointing device. The primary purpose of the mouse is to select text rapidly, scroll through a document and to choose commands from a menu. One gets the feeling that Word is built around the mouse and that the design of the program reflects the ease of selection possible with this pointing device.

Word has major design limitations in the entry, rather than the formatting of text. Text entry is delayed because it is not possible to move quickly within the text neighborhood. The cursor cannot be moved forward or backward by word, sentence or paragraph. The mouse is not a suitable device for short movements while entering text. Scrolling a longer distance with the mouse is accomplished by positioning a marker (called a "thumb") along the left border, which is a hit and miss affair.

Design of WordStar 2000

WordStar 2000, like the original WordStar, is built to facilitate the rapid entry of text. Whereas the old WordStar paid little attention to formatting (it did not even store

Figure 1: The opening menu of Wordstar 2000



```
A:\
                 OPENING MENU - 1 of 2

   Edit / create              Print                Get help
   Remove                     Copy                 Quit

   Directory / drive          Key glossary
   Move / rename              Typewriter mode
   Spelling correction        Format design

        Press a highlighted letter or Spacebar for more choices.
```

margins and tabs with the document), WordStar 2000 adds formatting nuances to text entry facility. (see main menu in Figure 1).

WordStar 2000 abides by the original concept of WordStar that all commands should be executable without removing the hands from the home keys. The original WordStar divides commands into four groups — QUICK, BLOCK, ONSCREEN and PRINT. All functions can be accessed by use of the <Ctrl> key, the first letter of the group and another letter to complete the command. Original WordStar also includes "dot commands" to control page formatting.

Consequently, one consistent complaint has been that WordStar commands are not mnemonic and require learning by rote. WordStar 2000 addresses this complaint directly by dividing commands into six new groups with a good attempt at making functions mnemonic. The six groups are: Cursor< C>, Blocks< B> Tabs and Margins < T>, Remove < R>, Print < P>, Key Glossary < K> and Options < O> — an assortment of functions, some of which replace dot commands.

Although past reviews of WordStar 2000 claim that it is an entirely new program, it can be seen as an attempt to address the deficiencies of WordStar that became apparent as new word processors appeared on the market. The press kit accompanying the program claims that WordStar 2000 was designed from the "wish lists" of users.

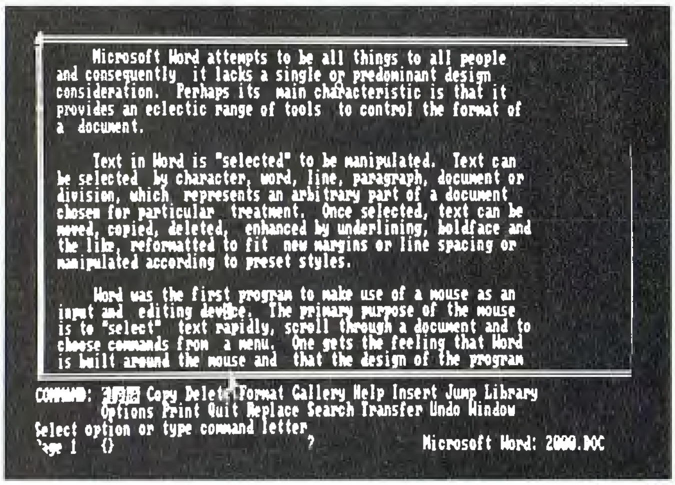
Unlike the original, WordStar 2000 does windows, has an undo command and a glossary, shows underlining and boldface on screen, has limited pre-formatted styles and six font options. It also has automatic hyphenation (which appears only at print time) and can handle arithmetic and sorting. It stores multiple ruler lines with the document. Microsoft Word, incidentally, includes all of these features except sorting and arithmetic.

The Microsoft Word screen has a border around the text area, with two command lines beneath — an information line and a status line (see Figure 2). As a result, the earlier version of Word left room for only 19 lines of text on the screen, giving the user a feeling similar to sitting between two fat people on a plane. However, Word 2.0 allows a work area of 22 lines (Figure 3), and the command area appears when necessary.

When used with a mouse, Word displays a large arrow as the mouse pointer and the cursor is an inverse block. In monochrome text mode, the mouse pointer is also an inverse block and it takes some concentration to distinguish between the two.

It is an easy thing in Word to split the screen into eight separate windows, all of which are surrounded by a border. It is not possible to collapse a window temporarily (as in Framework) and, as a result, the creation of a window occludes any existing text. Transient windows which could be shuffled on and off the screen as overlays would be more useful, but as it is, there is no method to close a window temporarily.

One of the advantages of WordStar is that help screens and the ruler line can be removed and a relatively clear screen displayed. With



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is built around the mouse and  that the design of the program
COMMAND: [illegible] Copy Delet Format Gallery Help Insert Jump Library
         Options Print Quit Replace Search Transfer Undo Window
Select option or type command letter
Page 1   {}                   ?             Microsoft Word: 2000.DOC
```

Figure 2: The Microsoft Word screen contains borders, command lines, leaving relatively little room for text.

WordStar 2000, the help menus take up more than a third of the screen (see Figure 4) but can be removed. However, the ruler line cannot be removed. On the monochrome screen the ruler line is presented as a glowing inverse video bar, which is both annoying and distracting. WordStar 2000 also allows multiple ruler lines. These are not displayed (unless desired) in the body of the text but rather the main ruler line expands or contracts to show the margin and tab settings of the particular text in which the cursor is located.

A big shock in WordStar 2000 is that there is no justification of text on the screen Some claim this is a bonus because it is possible to judge spaces between words and hyphenation more accurately. Many like the look of justification on the screen and old WordStar hackers have been known to make constructive use of the justification option (justified while in draft form, unjustified for final form).

Cursor movement

WordStar 2000 has an excellent choice of cursor movements, including the old WordStar "diamond". However, <Ctrl>-C, which moves down a screen in WordStar is now used as a prefix for all cursor commands, so that <Ctrl>-CD moves down a screen. Movement is possible to a page number, a footnote, one of the three windows, or to a character. Movement to a particular character requires five separate key strokes and would be a rarely used feature.

WordPerfect probably has the best array of cursor movements in a word processing package but the WordStar 2000 controls should be considered extensive and sensible. Unfortunately, MicroPro has removed the scrolling commands found in the old WordStar where the cursor stays in one place and the text is scrolled up or down.

Word has an appalling lack of cursor movements which, as previously stated, is probably a result of the existence of the mouse as the primary pointing device. However, pointing with a mouse is often difficult. First it is necessary to find out where the mouse is pointing, take a hand off the keyboard to locate it, drag the cursor down to the right spot and then press a button to mark the place for text entry. This is fine for long jumps, but to move two lines down and five words across is maddening.

Block movement

WordStar 2000 retains its predecessor's system of marking and manipulating blocks of text. The beginning of a block is marked first and then the end. The marked block can be moved, copied, written to disk, removed or sorted (up to 50 lines can be sorted on the first 20 characters). The advantage of this system is that after a block is marked, other work can be carried out elsewhere before a decision need be made on the block. Many word processors require a block to be moved or copied immediately once marked.

Marking or "selecting" text is at the heart of Microsoft Word design. As a result, it is an easy thing to mark a word in either direction, a sentence, a paragraph or the whole document. Marking a sequence of words is a bit more awkward and requires the use of the <F6><Expand> key and then one of the other selection keys. Using the mouse to mark text is a particularly facile exercise. After text is marked, a rapid method is provided to move or copy that text to another spot. There is clearly no system in any word processing package that makes it as easy to move or copy text as Microsoft Word used in combination with a mouse.

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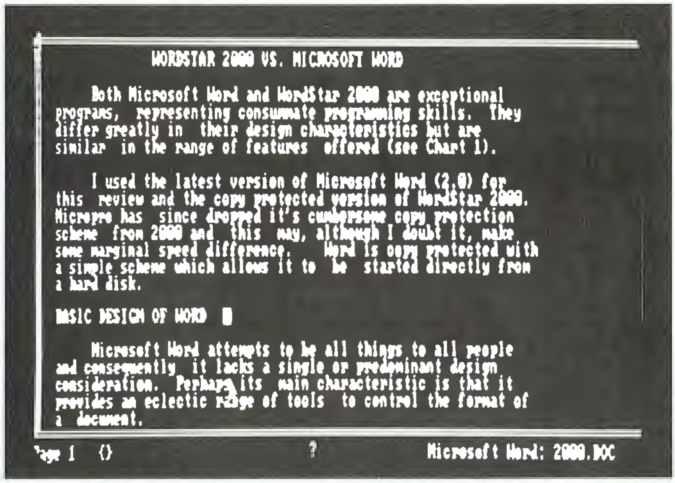
WordStar 2000 would be enhanced by the ability to mark a word, line, sentence or paragraph, quickly. Both programs would have benefited from the Wang system of jumping from the cursor to a particular character for marking a block. WordPerfect uses this sytem efficiently.

As WordStar 2000 has a good array of cursor movements, its limited block-marking facility can perhaps be excused. Microsoft Word has a superior system for marking blocks which does not, thank goodness, rely on its poor cursor controls.



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              WORDSTAR 2000 VS. MICROSOFT WORD

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BASIC DESIGN OF WORD  █

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provides an eclectic range of tools  to control the format of
a  document.

Page 1   {}                  ?              Microsoft Word: 2000.DOC
```

Figure 3: Microsoft Word version 2.0 allows more room for text than its predecessor.

Deleting text

Moving and copying blocks of text do not form a major part of an average work session. However, removal of portions of text is a crucial need for word processor users.

Text is selected in Word in the usual way and assigned to a "scrap" after the <Del> key is pressed. The erased text can be resurrected at any time by presing <Ins>, as long as it is not overwritten by a new deletion. Word also allows text to be removed permanently without sending it to the scrap. This method of removal to a buffer is perhaps the most common technique in word processing.

WordStar 2000 has a separate set of commands for removal of text, all of which are prefaced with <Ctrl>-R. An entire line can be removed, as can a word, sentence, paragraph or text to the left or right side of a line from the cursor position. There is also deletion to a specified character. Unfortunately, there is no direct method for removing the last word typed, a common need in text entry. WordStar 2000 also has an UNDO command to reinstate the last deleted text. The deletion commands are clearly more mnemonic than the old WordStar conundrums. However, all commands require a three-keystroke combination, while deletion of a word or line in the old WordStar is a two-keystroke affair.

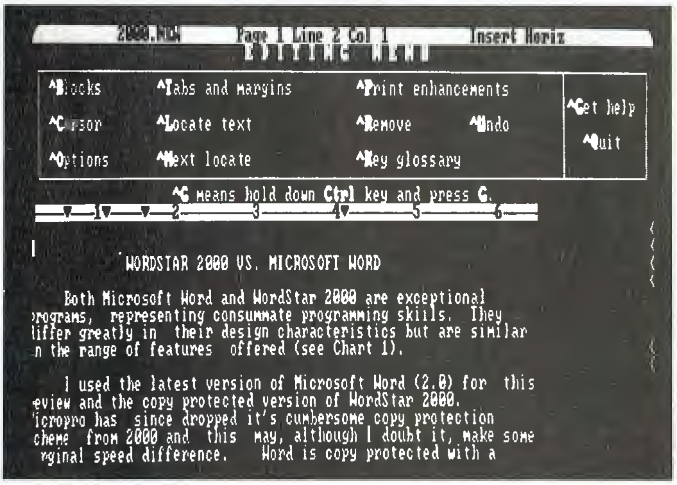
After many weeks of use, the quick selection and deletion in Microsoft Word appeared more consistent and flexible than deletion commands found in WordStar 2000. In favor of WordStar 2000 is the fact that all deletions can be made with hands remaining on the home keys. In favor of Microsoft Word is that only two keystrokes are necessary for most deletions, including the last word typed.

Text Formatting

Formatting options in WordStar 2000 offer more features than the old WordStar. Three overlapping sets of these options are provided, which are not part of a consistent design philosophy and are quite confusing to use until you get your own idea of how they all interrelate.

When a document is created or edited, WordStar 2000 asks the name of the "format file" to be used with that document. A format file consists of information on the design of the printed page (number of lines in the top margin, tab stops, etc). It also contains information on the font to be used, chosen from a limited range of 10 or 12 pitch proportional or non-proportional spaced fonts.

The proper way to look at these format files is as lists of defaults for matters such as page layout, margin settings, justification, display of page breaks and page numbering. The old WordStar requires a return to the Install program to reset the defaults



```
          2000.[illegible]      Page 1 Line 2 Col 1        Insert Horiz
                          EDITING MENU
 ^Blocks     ^Tabs and margins     ^Print enhancements        ^Get help
 ^Cursor     ^Locate text          ^Remove         ^Undo
 ^Options    ^Next locate          ^Key glossary               ^Quit
                 ^C means hold down Ctrl key and press C.
 ──▼──1▼───▼──2─────────3─────────4▼────────5─────────6──

           WORDSTAR 2000 VS. MICROSOFT WORD

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rginal speed difference.    Word is copy protected with a
```

Figure 4: The help menus generated by WordStar 2000 take almost half of the screen.

of most of these options.

The second set of formatting commands is accessed by the <Ctrl>-O prefix (for Options). Within these options are contained a group of commands for overrriding some defaults such as page numbering and justification. Also buried in this set of commands is widow and orphan control as well as headers and footers.

The third set of formatting commands is accessed by the <Ctrl>-T prefix (which stands for Tabs and margins). These commands include methods for indentation of both margins rapidly for quotes and the like, moving the margins in one tab stop at a time (useful for outlining) and moving the margins back out to the original setting. There is a decimal tab as well, which is particulary useful when WordStar 2000 does arithmetic. (This is accomplished by marking the numbers in a vertical or horizontal block and issuing the command <Ctrl>-BA for simple calculations to be carried out).

WordStar 2000 does on-screen underlining and boldfacing. There is no point in making a big deal about this — it should have been incorporated in the old WordStar.

There is no other program I know with as many formatting controls as Microsoft Word. This is particularly important as Word supports the HP LaserJet and the new Xerox laser printer. Although other programs may now support a laser printer (such as Spellbinder), the formatting capacities of Microsoft Word make the word processor/laser combination exceptional.

Formatting is very logical in Word. There is character formatting, which consists of underling and boldfacing with the unique addition of italics, small caps and a range of fonts. (Italics appear as such on a graphics monitor.)

Paragraphs can be formatted as left flush, right flush, centred, justified, with indented first lines and with hanging indent. There is a nice feature which adds an extra line automatically between paragraphs on a carriage return.

The FORMAT DIVISION command is used to designate a part of the text for special treatment. This command is also used to set up the page

EVALUATING WORD PROCESSING SOFTWARE AS A MATTER OF DESIGN

Most reviewers evaluate a word processor by making a list of functions and comparing them with the functions found in other packages. Here is another approach.

A software designer starts with a list of objectives. Gradually, the design of the program begins to dictate what features should be included and what form the software will take. The execution of a task in a word processor is a function of design and usually not the reverse. True, the designer has in mind to accomplish a certain task. From the moment code touches screen, it is apparent that the program has its own environment and tasks must be accommodated to fit.

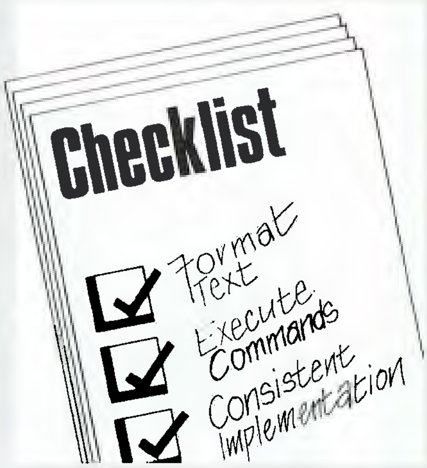
The process of software evaluation concerned with checking off functions on a list of possibilities is akin to examining a work of art with a check list.

How then does one evaluate word processing software? The starting-point is an analysis of the goals of the designer. As an example, OfficeWriter is based on the Wang standalone word processor. In use, it is apparent that it has been built around two main functions. The first is the control of formatting of text by multiple ruler lines. The second is the execution of commands by a two-step process — an option is chosen and then executed by pressing a key or cancelled by another.

More subtle analysis reveals many other design considerations, such as rapid formatting at the expense of on-screen justification.

After the goals of the designer are made manifest, the next issue is whether the implementation is consistent with the apparent design philosophy. You can say, for instance, that OfficeWriter is limited because it only can work on documents in memory. If its goal is speed on small documents, this may not be a flaw but a consistent feature.

Having ascertained the goals and the consistency of implementation with the design, it is then possible to examine the list of functions to see if it will do the job you require.



format for a document, including the method of page numbering, the running heads, the standard page size, margins and columns. Although the manual contains a poor explanation, Word allows text to be arranged in newspaper or magazine-style columns, which is of special significance when Word is combined with a laser printer.

Word enhances its formatting commands with the ability to set up "style sheets". As the manual explains: "A style sheet is a place where you can store formatting information to use again and again." Within a style sheet, a list of styles for particular aspects of a document (a quote justified and indented or a heading bold and centred) are defined and given a key code. After text is entered, it is selected, a list of available styles is then presented, a style is chosen and applied. A quicker alternative method is to select text and the use the <Alt> key and the key code to apply the style.

Few could ask for more than Word offers. The only difficulty is that formatting commands require a number of menus to be traversed before the format is applied to the text. First, a user must abandon the text and go to the Command menu, choose the FORMAT command and then a confusing sub-menu is presented which is not in alphabetical order.

Choices are made in that sub-menu by tabbing to the desired option. As an example, if indentation for paragraph is chosen, removing the indent (in order to type a heading at the left margin) involves so many steps that it is better to leave off indentation altogether and just use the space bar.

> ***Word allows text to be arranged in newspaper or magazine-style columns, which is of special significance when combined with a laser printer.***

Both programs provide for footnoting. Microsoft Word clearly has a better system, whereby the command to FORMAT FOOTNOTE is given and the footnote entered. Footnotes are stored at the end of a document and can be viewed at any time through a footnote window. As you scroll through the text, the footnote window also scrolls to show any footnotes which are referenced. The position of footnotes in the printed document is controlled easily so that footnotes can be on the same page as text where they are referenced or printed at the end of the document.

In WordStar 2000 a footnote is easily entered and remains in the text bracketed on either side with a comment as in [FOOTNOTE 3]. Footnotes cannot be positioned on the bottom of each page and can only be printed at the end of the document. The manual states "If you want blank lines between them, insert one or more blank lines at the end of each footnote you write." Another problem is that the footnotes conform to the text ruler that is in effect at the end of a document. Therefore, it is necessary to remember that a special ruler must be set up for the list of footnotes. For many scholarly documents, it is simply not enough only to have footnotes at the end of the document.

Reformatting

Microsoft Word only calculates page breaks during printing or during a separate repaginate operation. For a long document, it is

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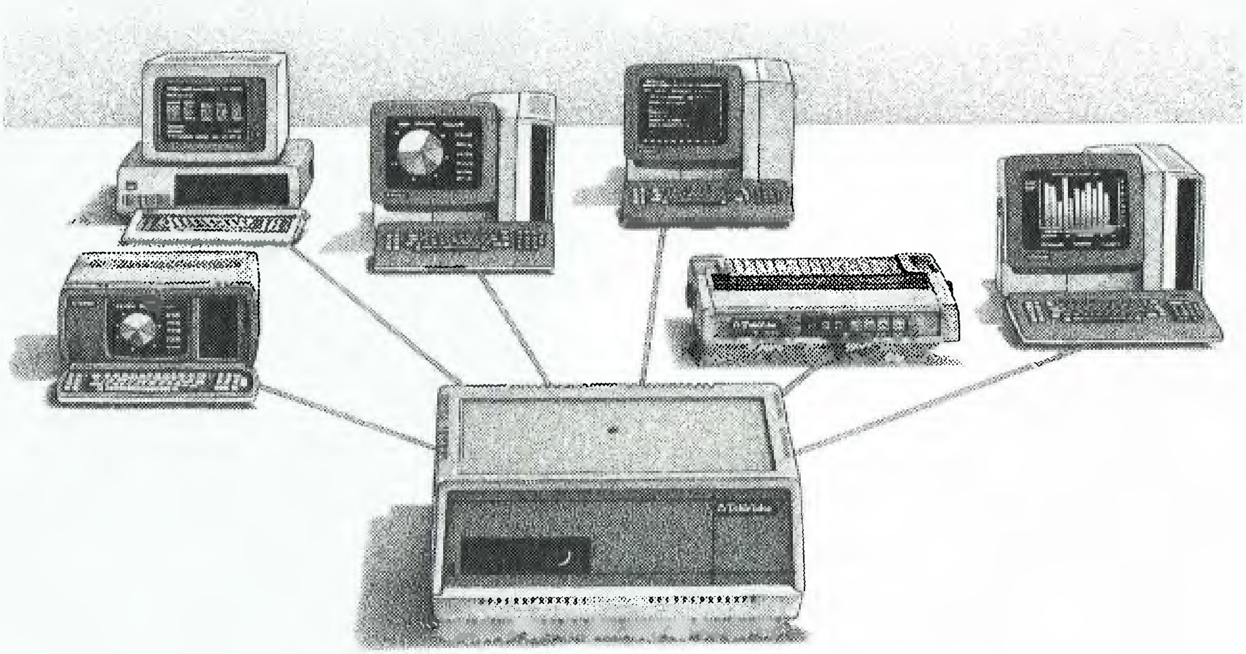

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not possible to jump to a page until the document has been repaginated. (Word 2.0 asks for confirmation for each page break.) The justification for this system in the manual is that Word must make a number of calculations which are complex as to widow and orphan control and other matters which depend on your formatting choices. Repagination is an anachronism.

WordStar 2000 will automatically display a page break at the end of the allocated number of lines. Special commands can be inserted to keep a group of words together on a line or to keep a group of lines together.

I find the WordStar 2000 system preferable to that of Word. Decisions can be made dynamically with WordStar 2000 which leads to clear formatting choices for subsequent pages — it is easier to see how to arrange page two and three after you know how page one is going to look.

Microsoft Word has an efficient "flying reform" of paragraphs when new text is inserted. Paragraphs instantly reform to the appropriate margins and the program can gather in all your keystrokes while other characters are shuffled down. WordStar 2000, as an improvement on the old WordStar, also uses automatic paragraph reform.

A now infamous bug in the reform feature means that when a word is wrapped to the next line it will stay there even though it belongs on the line above. For example, if the word "end" is the last word of a line and the word "the" is inserted incorrectly so it reads "theend" and that combination is wrapped to the next line, when a space is put between the two words, the word "the" does not return to the prior line.

A now infamous bug . . . when a word is wrapped to the next line it will stay there even though it belongs on the line above.

To insert boilerplate or carry out a string of commands, the glossary name (up to 15 characters) is typed and then <Esc>. Word's manual does not indicate any limit to the size of boilerplate. A glossary name can be up to 31 characters and boilerplate is easily inserted by one of the two convenient methods.

WordStar 2000 uses the CorrectStar spelling program which differs from the old WordStar version by the ability to check the spelling of a single word or particular paragraph. On a floppy system, this requires a disk change and a lengthy delay. On a fast hard disk system there is still enough of a delay to discourage checking individual words or paragraphs.

Word uses "The Word" spelling checker which is of the same quality as CorrectStar except that it does not check words phonetically. On a floppy system it is also very slow. "The Word" has been modified for Microsoft Word and presents a easy-to-use screen display to adjust spelling.

WordStar 2000 has an improved MailMerge, with dot notations replaced by commands. MailMerge now permits the conditional merging of text with IF — THEN — ELSE parameters. The WordStar 2000+ package offers a separate MailList program — a mini-database system that works with MailMerge. The Word merge facility also allows conditional insertion of text, but the procedure used in WordStar 2000 is preferable, as is the explanation of this facility in the manual.

The WordStar 2000+ package also

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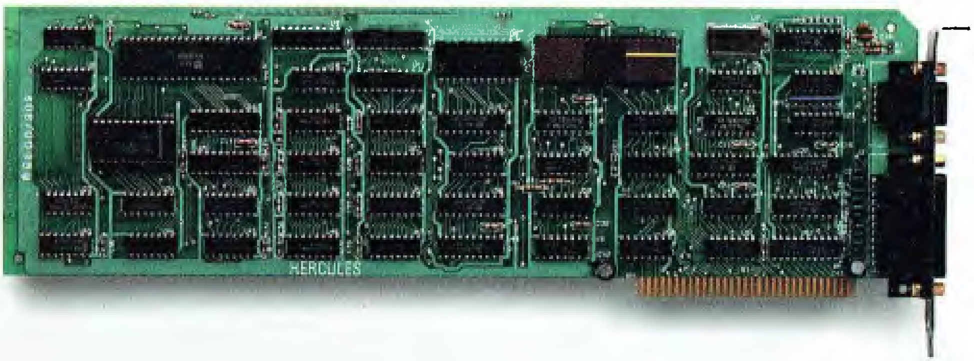

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offers indexing in the form of the StarIndex program and TelMerge for sending and receiving electronic mail. Neither was available for testing.

Speed and ease of use

Whereas prior versions of Word required two disks to be shuffled to load the program, the newer version requires only one disk. Word requires 256K-bytes to use the program fully. It rarely accesses to disk and when an overlay is called (such as Help), the movement is quick and the display almost instantaneous.

In contrast, WordStar 2000, which also requires 256K-bytes, calls in an overlay for almost every function, including deletion of a mere character. The Installation Guide states: "for some of its more powerful operations, WordStar 2000 requires up to 20 files to be open at once". The long and short of it is that WordStar 2000 is painfully slow to get going and excruciatingly slow on floppy disk. It can be said categorically that it should never be used on a floppy disk system.

WordStar 2000 appears to scroll through documents one character at a time. Even on a hard disk, three quick <PgDn> commands result in a blank screen for a few seconds until the program catches up. It takes about twice as long to scroll through a 20-page document on a hard disk than it does to scroll through the same file using the old WordStar on a floppy disk.

The bottom line

WordStar 2000's mnemonic commands are easy to learn and remember. Almost every command, however, requires three keystrokes. Many commands are assigned to function keys but the arrangement makes absolutely no sense whatsoever. The Install program can be used to reprogram the 10 function keys, either alone or with the shift key. As well, the 12 keys across the top of the keyboard in combination with the <Alt> key, and the numeric keypad with the <Ctrl> key can be reassigned.

WordStar 2000 is big, cumbersome and slow. If the old WordStar was called the Rolls-Royce of word processing (Cadillac in America), then 2000 is more like a 20-ton Mack truck. To stretch the analogy a bit further, Microsoft Word could be called the finicky Ferrari. It requires a lot of fine tuning to get you to your destination.

If I used a laser printer and control of formatting was the major objective, I would not hesitate to choose Microsoft Word. Since writing is my principal occupation, Word's attention to formatting is in the way of rapid text entry and correction. There is simply too much fiddling, changing between editing and command modes, repagination and other cumbersome procedures to make this a writer's choice.

Neither of these programs is my dream come true. If I had to choose, Microsoft Word would probably have the edge. Luckily, I don't have to. PC

Les Stein is an associate professor at the Law School of UWA.

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[illegible]

The PC compatibles introduced into Australia by European manufacturers Olivetti and Ericsson represent the state of the art in PC ergonomics. Ian Robinson puts the pair through their paces.

EURO-STYLE COMPUTING

Australia is in a unique geographical position when it comes to the availability of PC compatibles, being constantly under bombardment by a succession of models from manufacturers in the US, Japan and SE Asia. More recently, however, there has been a strong showing by several of the larger European companies, who have finally decided to "get with the strength" and leap on to the PC standard bandwagon.

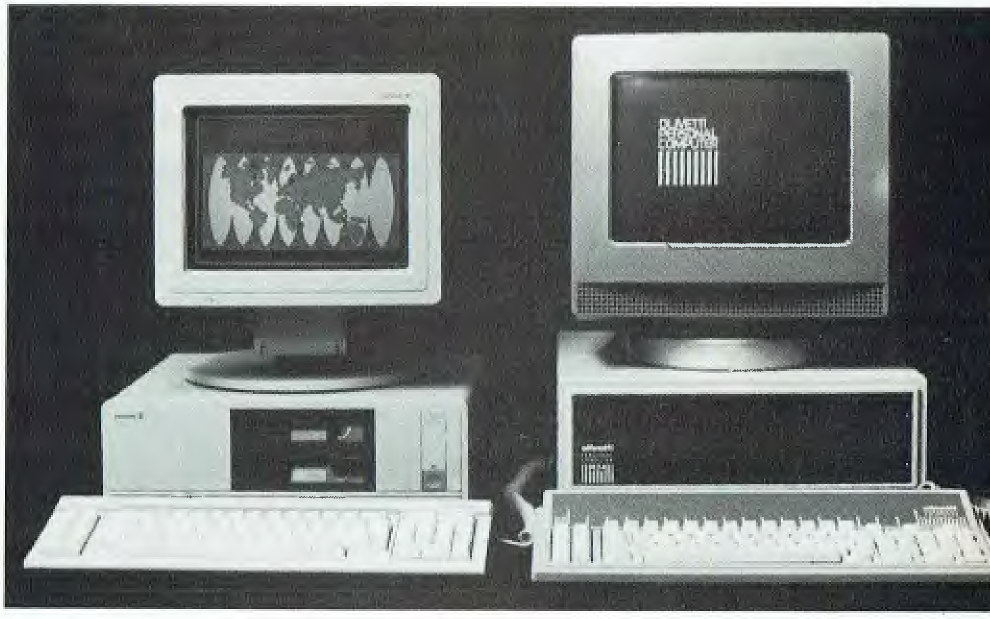
The two European companies which have made the biggest impact on the local PC-compatible market are probably Olivetti and Ericsson — the former a well-established Italian office equipment manufacturer and the latter a Swedish electronics and communications company which has enjoyed recent successes in the Australian EFT/POS market.

Each of these companies now offers a PC-compatible computer system — although PC compatibility is one of the few similarities the two enjoy. The overall design, specifications and marketing of the respective products have been tackled in dramatically different ways.

Consider, first of all, the physical presentation of each of these systems. While the Olivetti color scheme is a rather austere mixture of greys with light blue lettering (to blend in with most fashion-conscious office environments), the Ericsson is outfitted in a trendy shade of beige with a blending amber screen and burnt orange lettering — not unlike a North Sydney bus stop.

The respective color schemes highlight the thought that has gone into the overall design and presentation of the two systems — a factor that is taking increasing importance in the selection process for what are otherwise similarly-configured and priced PCs.

Now that office systems have become so standardised by the IBM PC influence, a major consideration for the purchase of second and subsequent machines is whether they will fit in harmoniously with the overall office environment, from staff to indoor plants. This is one area where European office equipment companies have



traditionally had the edge over their US and Asian counterparts, and both Olivetti and Ericsson have made the most of their inhouse design teams.

Take a look inside

While the Ericsson PC adheres to the typical PC compatible construction layout (albeit in a neater and more compact way than most), the Olivetti M24's internal design is a radical departure from the norm. The M24 motherboard is mounted upside-down, so that its components may be accessed without having to open up the system unit.

As a result, the normal PC expansion slots are not available on the standard system — a definite trap for new players. (An adapter card providing for up to seven PC compatible expansion boards may be bought separately.)

Despite its unusual orientation, the M24 motherboard is packed with features. The tutorial disk supplied with the system describes each major component with the help of an excellent active graphic display of the motherboard. These include the parallel and serial ports, disk drive controller circuitry, 8086 CPU, 8087 coprocessor socket and 256K-bytes of Ram. (The video circuitry is contained on a separate Olivetti board located next to the expansion slots).

The remainder of the system unit contains the two disk drives and a lot of open space for optional expansion cards (plus the adapter card, of course). The slimline disk drives come mounted with the A drive underneath — in contrast with the normal convention — although this may be changed by physically reshuffling the drives. A dim green power light sits in the lower right hand panel of the system unit, next to a hardware reset switch.

The Scandinavian revealed

The Ericsson PC is the first compatible I have come across to include a screwdriver with the packaging — full marks! Needless to say, the handle of this screwdriver is a tasteful shade of Ericsson beige, and it fits the two system unit screws perfectly.

Once the compact system unit cover is removed, a neat and well-deigned motherboard is revealed. Although the video adapter uses up one of the six PC standard expansion slots, the circuitry controlling the disk drives and parallel/serial interfaces is incorporated within the motherboard.

A single bank of eight DIP switches controls the system parameters such as monitor and disk drive configurations. The power supply area is well segregated from the remainder of the system unit, and is a good deal more compact than most.

Perhaps because of the multitude of features crammed into the Ericsson PC's motherboard, only 128K-bytes of Ram is mounted on the board itself. In order to offer a system comparable to most others on the market, the standard Ericsson PC also includes a short memory expansion board containing an extra 128K-bytes, bringing the total up to 256K-bytes.

Although this memory expansion board uses a special connector near the motherboard memory chips, it takes up valuable space in the expansion area of the system unit, effectively, leaving a total of three long slots and one short slot free for future expansion.

The Ericsson video controller board uses the same 6845 controller chip as just about every other PC compatible on the market, and its performance is similar. One notable difference from other systems is the unique character set used. Although the symbols are the same, their construction in many cases is strikingly different. For example, capital letters are notably smaller than digits, which resulted in many computer-oriented phrases (such as RS232C, 80C88 and X.25) appearing very unusually indeed. The serifs on many letters were also quite distinct, although this may not be quite as noticeable to observers from outside the publishing industry. The Ericsson amber monitor exaggerated these differences, as it appeared to display square pixels, unlike the more conventional round dots.

Ergo is not a dirty word

The Ericsson amber monitor is one of the most pleasant PC screens that I have used — a view shared by most others who have seen it in action. The non-glare coating and low contrast add to the monitor's

The compact Ericsson keyboard is smaller than the Olivetti keyboard, which incorporates a light-pen interface.

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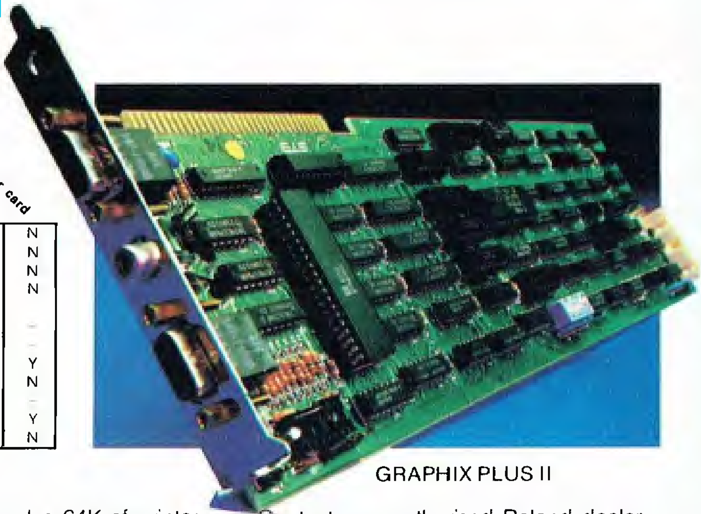
High resolution monochrome text	Y	Y	N	Y	Y	N
Automatic switching between monochrome and RGB	Y	-	-	N	-	-
Switch selectable monochrome and RGB	Y	-		Y		-
100% compatible with IBM display adaptors	Y	N	Y	Y	Y	Y
Printer port	Y	Y	Y	N	Y	N
Printer or bi-directional parallel port selectable	Y	N	N	-	N	-
Light pen	Y	N	Y	Y	N	Y
Clock calendar	O	N	N	N	N	N

"-" — Not Applicable *"O" — Optional* *"Y" — Yes* *"N" — No*



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overall ergonomic appeal. Supplied with the Ericcson monitor is the much-publiced "ergo-arm" stand (also in the same color-co-ordinated shade of beige), which allows the monitor to be raised or lowered to the most comfortable position.

The base of this arm forms a turntable, enabling the monitor to be swivelled horizontally. Unfortunately, to provide appropriate stability, the ergo-arm assembly itself is uncomfortably heavy, and care must be taken when lifting.

Ericsson also provides an optional floor stand for its PC (as does IBM with the recently-released PC AT), and the monitor stand is obviously designed for this clean keyboard-and-screen only environment. (Too bad if your task involves a lot of disk-swapping).

A further ergonomic consideration is noise level, and both systems operate very quietly — in fact the Olivetti disk drives are the quietest I have every experienced. The M24's externally-mounted cooling fan is noticeable but not irritating, and the Ericsson fan is barely noticeable.

Another nice Ericsson touch is the ability to thread the keyboard cable from the left, right or centre of the keyboard. But strangely enough both systems have keyboard connectors at the rear of the system units, effectively wasting most of the keyboard cable length.

The M24 keyboard is available in two different configurations — the earlier model with 18 function keys, and a more recent PC-like version with 10 function keys. The M24 keys are irritatingly light to the touch, and although many people would prefer this to the more definite action required by the Ericsson (or the IBM PC), touch-typists may find it quite frustrating, as simply resting on the home keys triggers off a few characters.

In its marketing campaign, Ericsson has been pushing the ergonomic aspects of its PC more than any other feature, in recognition of a topical subject that has long been a speciality of Swedish manufacturers.

Olivetti also emphasises the ergonomics of its PC, and it is in this area that both companies could possibly make large inroads into the local PC compatible market, particularly in the lucrative and ergonomics-conscious government tenders.

Distribution and support

While Ericsson had trodden the more typical path and worked hard on establishing a dealer network from scratch, Olivetti has taken the unprecedented step of allowing its PCs to be sold through the Dick Smith Electronics network.

Servicing the Olivetti M24 will be performed by Olivetti technicians, even if the systems are sold through Dick Smith. Ericsson has added a new twist to the current PC warranty wars by offering a three-year warranty, although this is described as an optional (chargeable) extra in the small print.

Both systems are highly PC-compatible, in fact I did not find one item of software that would not run on either. The only potential problem could lie in the M24's use of the faster 8086 processor rather than an 8088, but in my opinion the speed improvement far outweighs any supposed annoyances caused by incompatibility with time-dependent software.

These two systems represent the beginnning of a strong European presence in the local PC compatibles market, which will soon be reinforced by further systems from Philips, ACT, Siemens and others.

Both the Olivetti M24 and the Ericsson PC typify the new approaches in design and functionality that European systems of the future will offer the PC buyer, and for that reason alone are worth looking at.

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All three monitors include a tilt and swivel base. Use your Qubie' monitor as you would the IBM ; it will in no way affect the normal use or function of your Personal Computer.

Technical Data - HR31 200

CRT Size:	14" Diagonal (34cm)
Tube:	Black Matrix
Sync-H. Scan Frequency:	15.7kHz
V. Scan Frequency:	60Hz
Signal Type:	RGB I: TTL Level Positive Sync H/V: TTL Level Positive
Display Size (H x V):	245mm x 170mm
Retrace Time (H x V):	0.5Ms x 0.4msec
Resolution:	640 x 200 lines
Input Terminals:	9 pin "D" type connector
Dimensions:	11"(H) x 15"(W) x 13"(D) 266(H) x 367(W) x 318(D)mm
Shipping Weight:	15.9kg

Model HR31 200

Models HR 39 & HR 134 (This model in mirror reverse)

Technical Data - HR 39 & HR 134

CRT Size:	12" Diagonal (29cm)
Phosphor:	HR 39 (Green) HR 134 (Amber)
Sync-H. Scan Frequency:	18.432kHz
V. Scan Frequency:	50/60Hz
Signal Input:	Video - TTL Level Positive Sync. H - TTL Level Positive Sync V - TTL Level Negative
Video Response:	20MHz
Display Size (H x V):	203mm x 135mm
Display Time (H x V):	44Ms x 18.99msec
Resolution:	Centre 1 000 lines Corner 800 lines
Display Formats:	9 x 14 matrix 2000 characters in 80 x 25 format
Input Terminals:	9 pin "D" type connector
Dimensions:	10.5"(H) x 15"(W) x 12"(D) 257(H) x 367(W) x 294(D)mm
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Creating form letters, or mailmerging, can be achieved using Lotus 1-2-3 or Symphony. Barry Roberts demonstrates both methods.

Mailmerging with LOTUS

Symphony has been heralded widely as the great leap forward in "kitchen-sink" integrated software. While Symphony does have significant advantages over Lotus 1-2-3 there are times when Lotus 1-2-3 can be manipulated to have features that are closely comparable to those of Symphony. This article covers one of these applications for both Symphony and Lotus 1-2-3, namely the creation of form letters from a list of names and addresses.

Symphony allows greater flexibility in this type of exercise, yet with the skilful employment of keyboard macros Lotus 1-2-3 can be made to print form letters just as efficiently. The Symphony and Lotus 1-2-3 worksheets are printed out in Listings 1 to 6.

Lotus 1-2-3 solution

For the Lotus 1-2-3 method you need to create three separate areas within the worksheet — one for the list of names and addresses, another for the form letter itself and a further area for macros. It is preferable to keep these areas separate as it is easier to document and to keep track of processing. It is also important to have the areas set up where they cannot interfere with each other.

This point is particularly important with Lotus 1-2-3, as you can only define a single column-width for an entire column. Since different column-widths are used in this application, the three areas are set up side by side in the worksheet. (On the other hand, Symphony allows differing column-widths for individual columns by virtue of its window feature.)

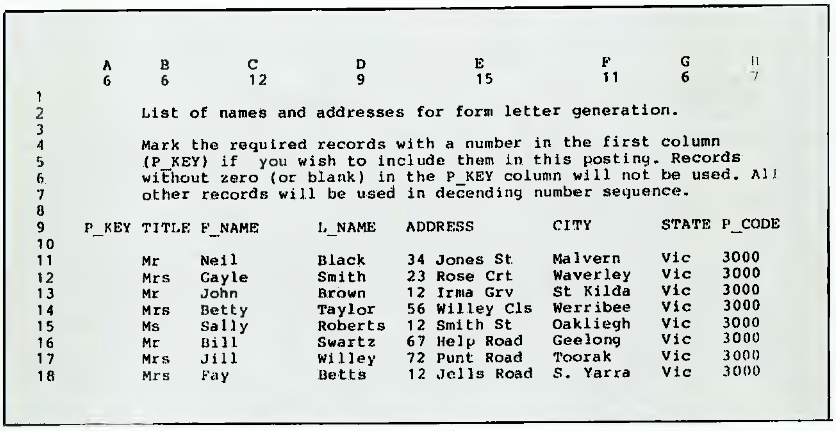
For ease of data entry, the list of names and addresses is placed in columns A to H inclusive (in row 9), with the column-widths set to allow all of them to be displayed on the screen at once. Although it does not affect the actual form letter production if the list does turn out to be too long for the columns, it makes the names difficult to read. There is also a narrative included above the list to remind users how to operate this model.

The next area to be defined is the form letter itself, which is placed into column I. The column is expanded to a width of 72 characters (/Worksheet Column-width Set 72), and all text is inserted as a long label. To use Lotus 1-2-3's primitive text-handling abilities you need to become familiar with the Range Justify command. As with all Lotus 1-2-3 commands, the name gives a good indication of what it does. To try out this command in the current example place your cursor in cell I13 and type a sentence of about 150 characters. Notice how the characters scroll off the screen after about 80 or so are typed in.

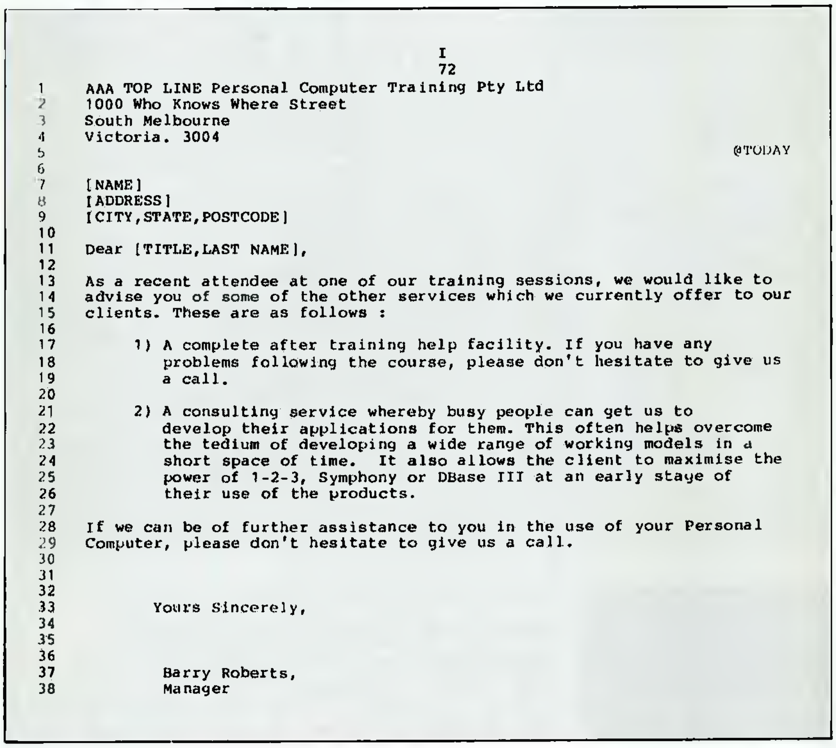
Lotus 1-2-3 can handle up to 240

characters per cell, and typing any more than this will cause the program to beep at you. Pressing the return key enters the sentence into the current cell, although only the first 72 characters will be displayed. Now select /Range Justify, then highlight the range I13..I15 with the cursor. The text in the current cell will be justified over this area, once the return key is pressed. To get the right indentation you can now clean up the line with the Edit function <F2>, and you could further add to the appearance of the document by altering the label-prefix, with the /Range Label-prefix command.

To set up the form letter, a header is included in the first four rows of the letter area, and in rows 7 to 11 lies a description of their potential contents, which is later overwritten when the macros are activated. These are included to improve the layout of the letter and to prevent the macro from placing client details in the wrong cells.



```
         A     B         C         D           E          F      G     H
         6     6        12         9          15         11      6     7
 1
 2             List of names and addresses for form letter generation.
 3
 4             Mark the required records with a number in the first column
 5             (P_KEY) if  you wish to include them in this posting. Records
 6             without zero (or blank) in the P_KEY column will not be used. All
 7             other records will be used in decending number sequence.
 8
 9       P_KEY TITLE F_NAME      L_NAME   ADDRESS        CITY       STATE P_CODE
10
11             Mr    Neil        Black    34 Jones St    Malvern    Vic   3000
12             Mrs   Gayle       Smith    23 Rose Crt    Waverley   Vic   3000
13             Mr    John        Brown    12 Irma Grv    St Kilda   Vic   3000
14             Mrs   Betty       Taylor   56 Willey Cls  Werribee   Vic   3000
15             Ms    Sally       Roberts  12 Smith St    Oakliegh   Vic   3000
16             Mr    Bill        Swartz   67 Help Road   Geelong    Vic   3000
17             Mrs   Jill        Willey   72 Punt Road   Toorak     Vic   3000
18             Mrs   Fay         Betts    12 Jells Road  S. Yarra   Vic   3000
```



```
                                      I
                                      72
 1   AAA TOP LINE Personal Computer Training Pty Ltd
 2   1000 Who Knows Where Street
 3   South Melbourne
 4   Victoria. 3004
 5                                                                    @TODAY
 6
 7   [NAME]
 8   [ADDRESS]
 9   [CITY,STATE,POSTCODE]
10
11   Dear [TITLE,LAST NAME],
12
13   As a recent attendee at one of our training sessions, we would like to
14   advise you of some of the other services which we currently offer to our
15   clients. These are as follows :
16
17        1) A complete after training help facility. If you have any
18           problems following the course, please don't hesitate to give us
19           a call.
20
21        2) A consulting service whereby busy people can get us to
22           develop their applications for them. This often helps overcome
23           the tedium of developing a wide range of working models in a
24           short space of time.  It also allows the client to maximise the
25           power of 1-2-3, Symphony or DBase III at an early stage of
26           their use of the products.
27
28   If we can be of further assistance to you in the use of your Personal
29   Computer, please don't hesitate to give us a call.
30
31
32
33          Yours Sincerely,
34
35
36
37           Barry Roberts,
38           Manager
```

Listing 1: The database area is in columns A to H of the Lotus 1-2-3 worksheet.

Listing 2: The actual letter text itself is squashed into column I.

Macros make life easier

Now for the most important part of the model — the macros. Macros are simply a means of storing routine keystroke sequences for repeated use. All of the operations used in the macros employed here could of course be performed manually, but it would be a very time-consuming exercise. Macros are a great timesaver once mastered.

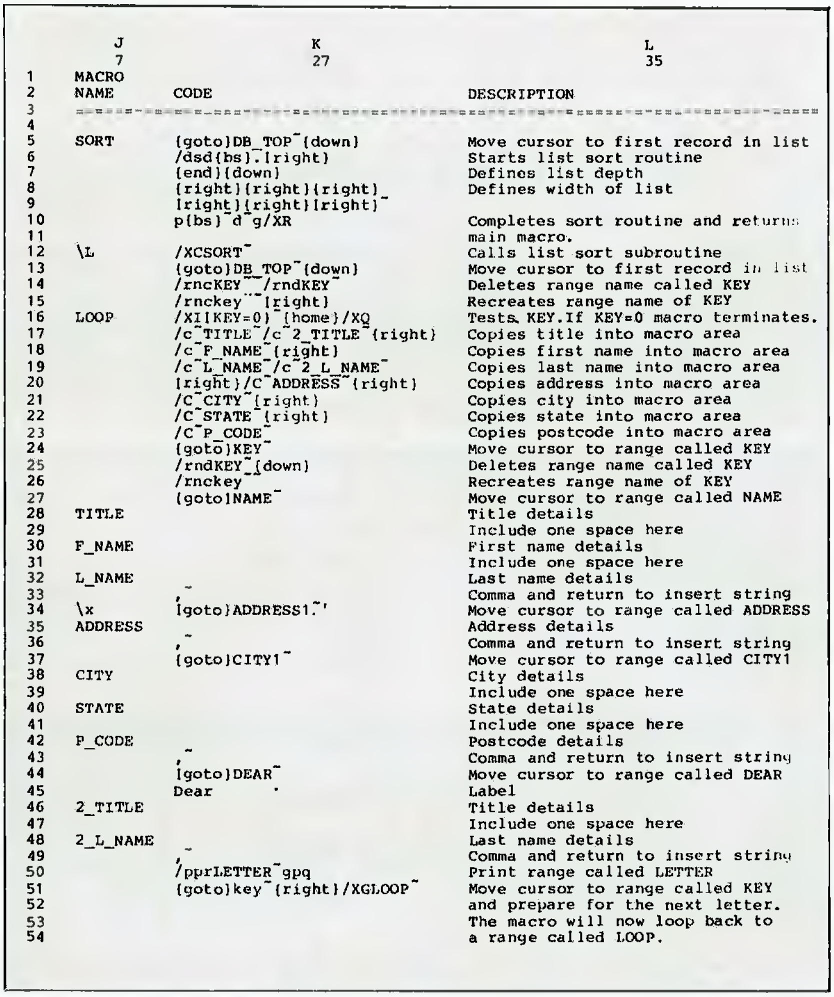
As can be seen in Listing 3, long macro strings can begin to look like Chinese after a while. Consequently, to aid in debugging, it is very important to document all macros with a short description of each step, as shown on the right hand side of the macro code listing.

The first macro sorts all of the records in the names and addresses database into those scheduled to receive letters and those that will not.

In this example, only those records marked with a number in the first columm (P_KEY) are to be included in this posting, while records with a zero (or blank) in the P_KEY column are not. All other records are to be used in descending number sequence, which allows the user to produce letters in groups for special mailings and so on.

To sort the database we first have to define the range to be sorted. This is done by moving the cursor to the left-hand side of the first record in the database. As the top left-hand corner of the database is named DB_TOP, this is easily achieved by moving the cursor to the range called DB_TOP and then moving it down one cell. This operation is performed by the macro in cell K5.

The next step in defining the database range is to use the Data Sort Data-range command, which prompts you for a range. The definition of the range is completed by highlighting the area covering the top left corner of the first record and the bottom right-hand corner of the last record.



```
          J                      K                                     L
          7                      27                                    35
 1      MACRO
 2      NAME      CODE                          DESCRIPTION
 3      ==========================================================================
 4
 5      SORT      {goto}DB_TOP~{down}           Move cursor to first record in list
 6                /dsd{bs}.{right}              Starts list sort routine
 7                {end}{down}                   Defines list depth
 8                {right}{right}{right}         Defines width of list
 9                {right}{right}{right}~
10                p{bs}~d~g/XR                  Completes sort routine and returns
11                                              main macro.
12      \L        /XCSORT~                      Calls list sort subroutine
13                {goto}DB_TOP~{down}           Move cursor to first record in list
14                /rncKEY~~/rndKEY~             Deletes range name called KEY
15                /rnckey~~{right}              Recreates range name of KEY
16      LOOP      /XI(KEY=0)~{home}/XQ          Tests KEY.If KEY=0 macro terminates.
17                /c~TITLE~/c~2_TITLE~{right}   Copies title into macro area
18                /c~F_NAME~{right}             Copies first name into macro area
19                /c~L_NAME~/c~2_L_NAME~        Copies last name into macro area
20                {right}/C~ADDRESS~{right}     Copies address into macro area
21                /C~CITY~{right}               Copies city into macro area
22                /C~STATE~{right}              Copies state into macro area
23                /C~P_CODE~                    Copies postcode into macro area
24                {goto}KEY~                    Move cursor to range called KEY
25                /rndKEY~{down}                Deletes range name called KEY
26                /rnckey~                      Recreates range name of KEY
27                {goto}NAME~                   Move cursor to range called NAME
28      TITLE                                   Title details
29                                              Include one space here
30      F_NAME                                  First name details
31                                              Include one space here
32      L_NAME                                  Last name details
33                ,~                            Comma and return to insert string
34      \x        {goto}ADDRESS1~'              Move cursor to range called ADDRESS
35      ADDRESS                                 Address details
36                ,~                            Comma and return to insert string
37                {goto}CITY1~                  Move cursor to range called CITY1
38      CITY                                    City details
39                                              Include one space here
40      STATE                                   State details
41                                              Include one space here
42      P_CODE                                  Postcode details
43                ,~                            Comma and return to insert string
44                {goto}DEAR~                   Move cursor to range called DEAR
45                Dear                          Label
46      2_TITLE                                 Title details
47                                              Include one space here
48      2_L_NAME                                Last name details
49                ,~                            Comma and return to insert string
50                /pprLETTER~gpq                Print range called LETTER
51                {goto}key~{right}/XGLOOP~     Move cursor to range called KEY
52                                              and prepare for the next letter.
53                                              The macro will now loop back to
54                                              a range called LOOP.
```

Listing 3: The Lotus 1-2-3 macro to be used is stored in columns J to L.

This can be easily achieved, by first pressing the backspace key to turn the cursor into a single cell pointer at the top left corner of the first record, then pressing the decimal point and moving the cursor to the bottom right-hand corner of the database, followed by the return key. This is automated by first moving the cursor one cell to the right and then pressing <End> and the down arrow, to move the cursor to the last record. Then the cursor is moved to the end of this record with a series of right arrow key movements.

The reason the cursor was moved one cell to the right first is because the <End> <Down> keystroke sequence moves the cursor to the next break in the worksheet. If this had been done in column A the cursor would only have reached the last record if there was an entry in each row, otherwise the cursor would stop at the first empty cell.

As column B always contains an entry, the cursor must reach the last record. Having defined the data range to be sorted, the macro now defines the primary sort key as the current cell (P_KEY). (Pressing the backspace key ensures that the current cell is used as the primary sort key). A descending sort has been selected to ensure that those records with a number in column A will appear before those without.

Macros within macros?

To illustrate the use of macro subroutines, I have designed this macro as a subroutine linked into the main macro (\L) via a subroutine call (the /XC statement in cell K12). The macro could just have easily been part of the main macro, but it is a good idea to break up your macros into small manageable routines rather than one very long procedure. This approach allows you to set up and debug the smaller subroutines before bringing them together into a larger procedure. To complete a Lotus 1-2-3 subroutine you need to include a /XR statement at the end.

This returns control back to the main macro, at the point immediately following the original /XC command.

As with all macros, subroutines require a range name to be accessed. Range names are an important part of the function of this model, and a list of the range names used is included in Listing 4, along with a list of the global settings. It is not possible to print out this information using normal Lotus 1-2-3 commands. Instead, the printouts were prepared by a Lotus 1-2-3 utility program called DocuCalc. This utility, which I use extensively, also enables printing of worksheet formulae in a grid format as well as providing full cross-referencing.

Sequence of operations

The main macro commences in cell K12 with the subroutine call. The next step moves the cursor to the top of the database, creates a range called KEY and then deletes it. (The first step is redundant, if a range called KEY is already named in the worksheet, but a range name must exist before it can be deleted.)

It is necessary to delete the range name

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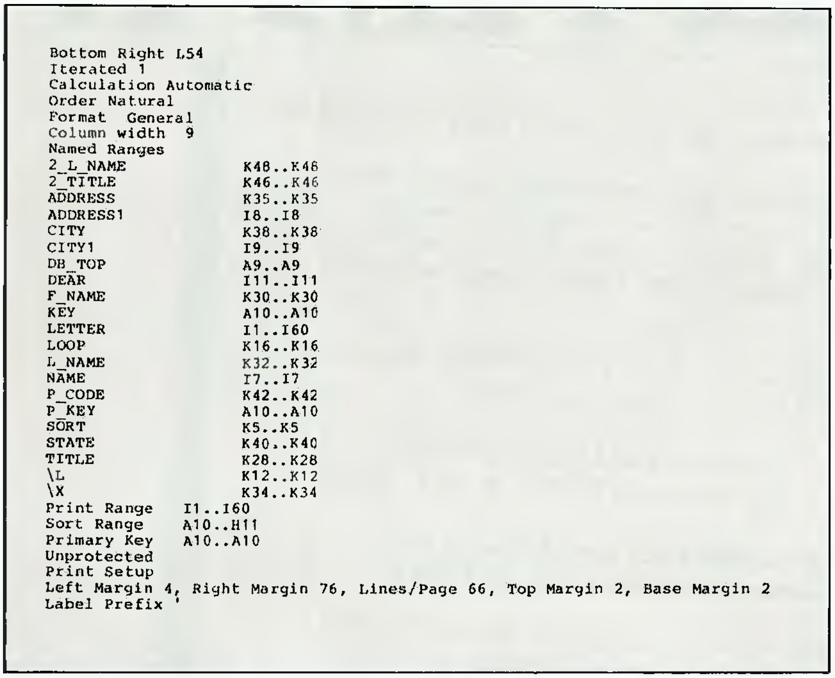

```
Bottom Right L54
Iterated 1
Calculation Automatic
Order Natural
Format  General
Column width  9
Named Ranges
2_L_NAME              K48..K48
2_TITLE               K46..K46
ADDRESS               K35..K35
ADDRESS1              I8..I8
CITY                  K38..K38
CITY1                 I9..I9
DB_TOP                A9..A9
DEAR                  I11..I11
F_NAME                K30..K30
KEY                   A10..A10
LETTER                I1..I60
LOOP                  K16..K16
L_NAME                K32..K32
NAME                  I7..I7
P_CODE                K42..K42
P_KEY                 A10..A10
SORT                  K5..K5
STATE                 K40..K40
TITLE                 K28..K28
\L                    K12..K12
\X                    K34..K34
Print Range   I1..I60
Sort Range    A10..H11
Primary Key   A10..A10
Unprotected
Print Setup
Left Margin 4, Right Margin 76, Lines/Page 66, Top Margin 2, Base Margin 2
Label Prefix '
```

Listing 4: A list of range names and global settings, as produced by DocuCalc.

initially in case two range names share the same location. If this is the case, when the range is relocated, both ranges will be redefined together — a definite trap for new users. Once the range name has been deleted, the macro names the current cell with the name of KEY and then moves the cursor one cell to the right.

The next part of the macro (range name LOOP) tests the cell called KEY for a zero entry. If it is zero, then the macro will move the cursor to A1 and terminate itself with an /XQ command. While KEY contains a non-zero entry, signifying that we want to send a letter to this client, the macro continues.

The names in column J are in fact the range names for the cells directly to their right. This technique is followed for ease of documentation (so we can locate range names quickly from within the worksheet) and because once labels are stored in this format the /Range Name Labels Right command can be used, which spares us the tedium of having to create each range name individually.

Self modifying macros

It is appropriate to discuss at this point the use of dynamic macro techniques, as employed in this worksheet. This means that the macros actually modify themselves as they are processing, hence the first part of the macro can be designed to alter the subsequent macro code.

The first dynamic macro, contained in cell K17, copies the current cell (the client's title) to ranges called TITLE and 2_TITLE, which are located within the macro in cells K28 and K46 respectively. The macro then moves the cursor one cell to the right. The macro in the range K18..K23 performs similar operations, and those in the range K24..K26

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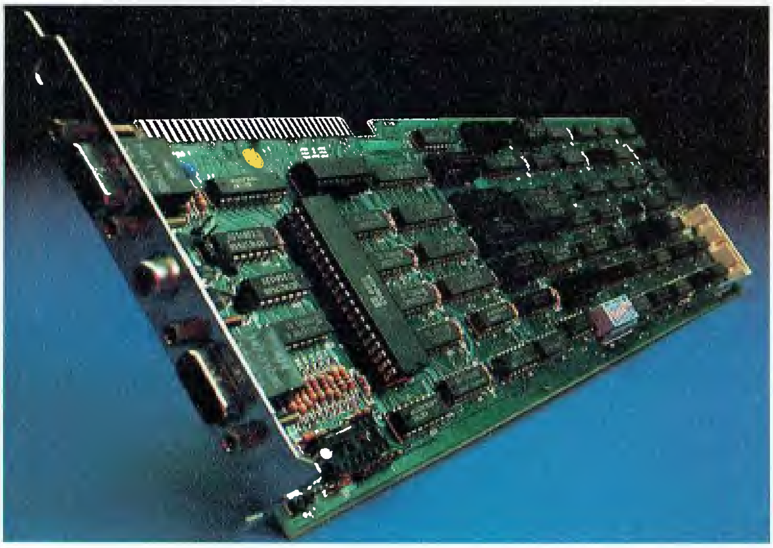

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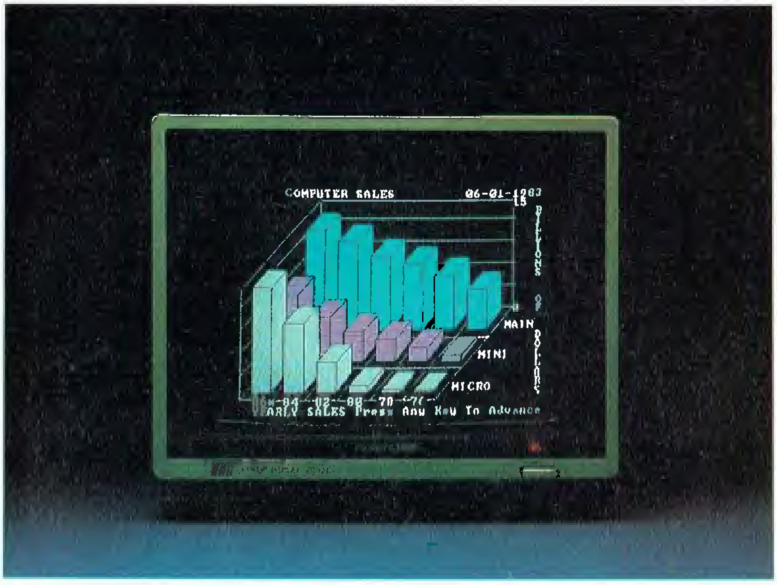

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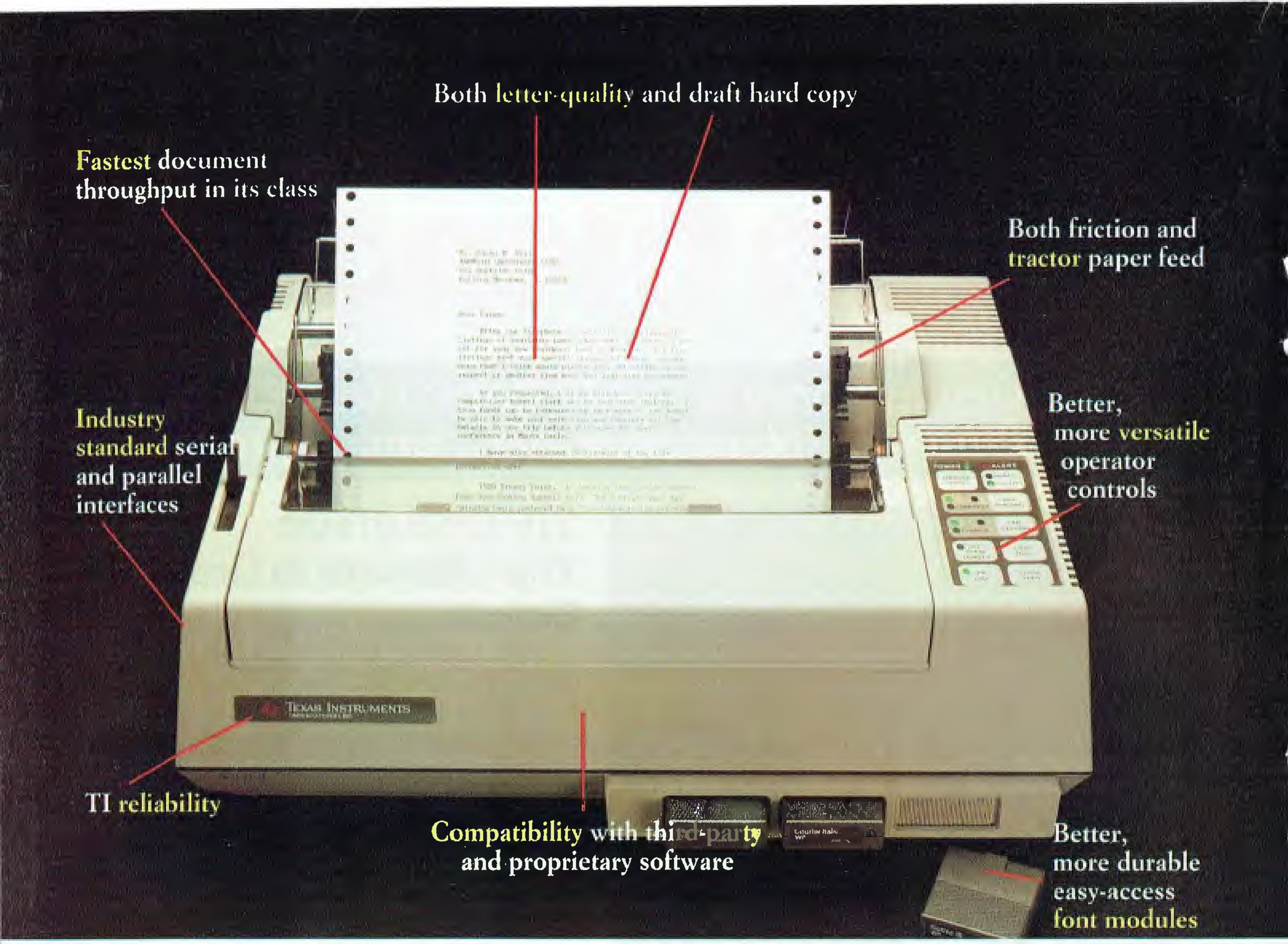
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delete the range name of KEY and then relocate it on the next row.

After the macro has modified itself, it can go ahead and create the names and addresses and print them in the required areas within the form letter. The macro in the range K27..K33 forms the title, first name and surname to be located in the range called NAME.

First the macro moves the cursor to cell I7 and then types in the contents of the cells K27..K33 until the tilde character (~) which is the macro equivalent of the return key. It is important to include spaces in the cells K29 and K31 as these will separate the title, first name and surname. The remainder of the macro up to K49 performs similar functions.

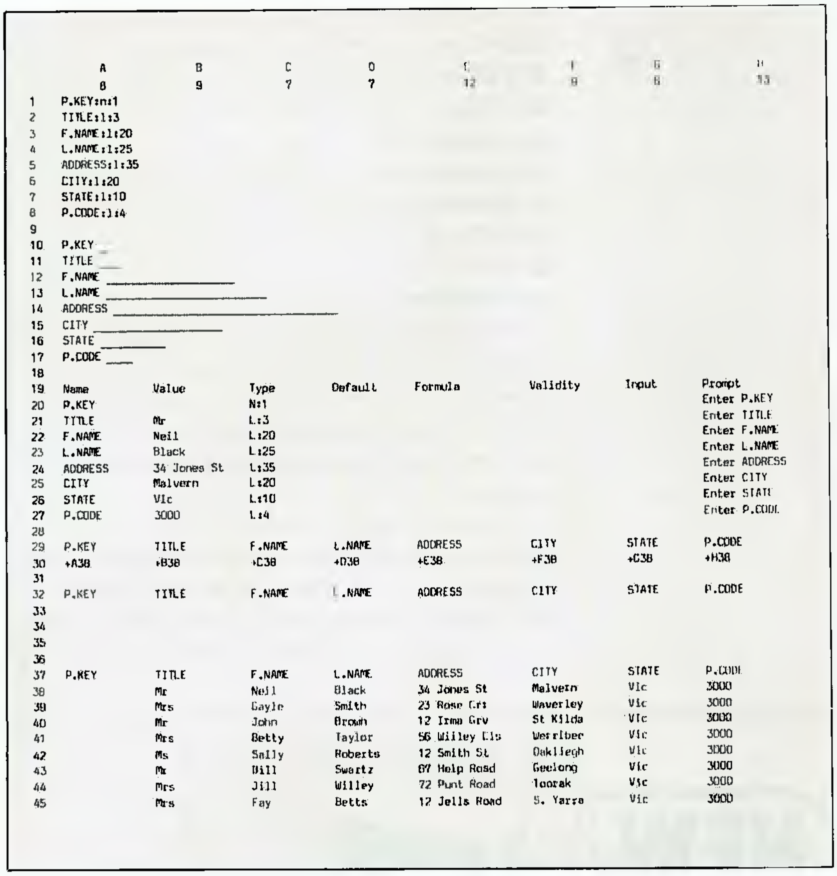
It is important to note that the postcode needs to be included as a label (not a number) in the database area, otherwise the macro will not function past K42. Macros will only process a series of labels and when the cursor reads a number it assumes that the macro has concluded. To enter the postcode as a label you can use the left-alignment feature (") or press the space bar first.

Finally, the macro in K50 prints out the letter and automatically paginates for the next. The letter has previously been given the the range name of LETTER. Next, the macro moves the cursor to the cell one to the right of range called KEY. The range called KEY has already been updated by the macro in range K24..K26 so that it is pointing to the next client record. The macro now loops back to continue processing at cell K16, controlled by the Lotus 1-2-3 branch statement /XGLOOP. The macro continues to loop until the range KEY is zero, that is until it reaches the first client that we do not want to send a letter to.

The Symphony solution

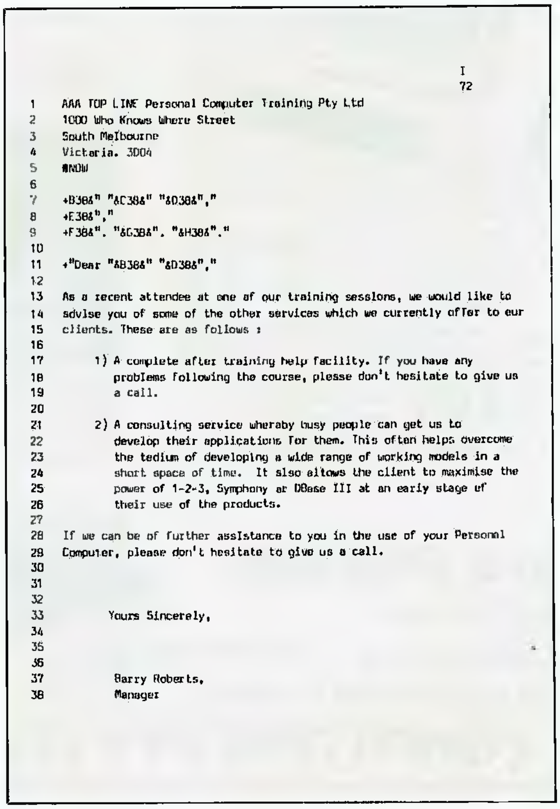
Well, that was some marathon effort! Clearly it is possible to use Lotus 1-2-3 for this type of operation, but it is similar to using an axe to fell a tree when a chainsaw would have been more appropriate. Enter Symphony — what now follows is the Symphony solution to this same problem.

To create the Symphony database you



```
          A          B         C         D         E          F         G          H
          8          9         7         7         12         8         8          13
1    P.KEY:n:1
2    TITLE:l:3
3    F.NAME:l:20
4    L.NAME:l:25
5    ADDRESS:l:35
6    CITY:l:20
7    STATE:l:10
8    P.CODE:l:4
9
10   P.KEY __
11   TITLE ___
12   F.NAME ____________________
13   L.NAME _________________________
14   ADDRESS ___________________________________
15   CITY ____________________
16   STATE __________
17   P.CODE ____
18
19   Name       Value          Type      Default   Formula      Validity   Input     Prompt
20   P.KEY                     N:1                                                   Enter P.KEY
21   TITLE      Mr             L:3                                                   Enter TITLE
22   F.NAME     Neil           L:20                                                  Enter F.NAME
23   L.NAME     Black          L:25                                                  Enter L.NAME
24   ADDRESS    34 Jones St    L:35                                                  Enter ADDRESS
25   CITY       Malvern        L:20                                                  Enter CITY
26   STATE      Vic            L:10                                                  Enter STATE
27   P.CODE     3000           L:4                                                   Enter P.CODE
28
29   P.KEY      TITLE          F.NAME    L.NAME    ADDRESS      CITY       STATE     P.CODE
30   +A38       +B38           +C38      +D38      +E38         +F38       +G38      +H38
31
32   P.KEY      TITLE          F.NAME    L.NAME    ADDRESS      CITY       STATE     P.CODE
33
34
35
36
37   P.KEY      TITLE          F.NAME    L.NAME    ADDRESS      CITY       STATE     P.CODE
38              Mr             Neil      Black     34 Jones St  Malvern    Vic       3000
39              Mrs            Gayle     Smith     23 Rose Crt  Waverley   Vic       3000
40              Mr             John      Brown     12 Irma Grv  St Kilda   Vic       3000
41              Mrs            Betty     Taylor    56 Willey Cls Werribee  Vic       3000
42              Ms             Sally     Roberts   12 Smith St  Oakliegh   Vic       3000
43              Mr             Bill      Swartz    87 Help Road Geelong    Vic       3000
44              Mrs            Jill      Willey    72 Punt Road Toorak     Vic       3000
45              Mrs            Fay       Betts     12 Jells Road S. Yarra  Vic       3000
```

Listing 5: The Sheet mode is used for mailmerging with Symphony.



```
                                                                  I
                                                                  72
1    AAA TOP LINE Personal Computer Training Pty Ltd
2    1000 Who Knows Where Street
3    South Melbourne
4    Victoria. 3004
5    @NOW
6
7    +B38&" "&C38&" "&D38&","
8    +E38&","
9    +F38&". "&G38&". "&H38&"."
10
11   +"Dear "&B38&" "&D38&","
12
13   As a recent attendee at one of our training sessions, we would like to
14   advise you of some of the other services which we currently offer to our
15   clients. These are as follows :
16
17         1) A complete after training help facility. If you have any
18            problems following the course, please don't hesitate to give us
19            a call.
20
21         2) A consulting service wheraby busy people can get us to
22            develop their applications for them. This often helps overcome
23            the tedium of developing a wide range of working models in a
24            short space of time.  It also allows the client to maximise the
25            power of 1-2-3, Symphony or DBase III at an early stage of
26            their use of the products.
27
28   If we can be of further assistance to you in the use of your Personal
29   Computer, please don't hesitate to give us a call.
30
31
32
33            Yours Sincerely,
34
35
36
37            Barry Roberts,
38            Manager
```

Listing 6: The Document mode in Symphony is used to create the letter.

should enter Sheet mode and type in the following lines to the first eight cells:

A1 P.KEY:n:1
A2 TITLE:1:3
A3 F.NAME:1:20
A4 L.NAME:1:25
A5 ADDRESS:1:35
A6 CITY:1:20
A7 STATE:1:10
A8 P.CODE:1:4

The labels will form the fields of the database as well as the headings on the input form. The "n" or "l" signifies whether the field will be a number or label field, and the number determines the field sizes for the database.

You should then turn the work environment into Form mode to enable you to generate the database. To do this, press the Menu key <F10> and select Generate, choose Labels as the default field with a default field length of 9, type in 'MAIN' as the name for the database setting sheet (followed by the return key), press the <Tab> key and highlight the range A1..A8 and again press the return key.

The database should now be automatically generated by Symphony and a form should appear on the screen for you to insert your client details. If you change the work environment back to Sheet it should look like Listing 5.

Enter the word processor

To create the form letter you can use the Symphony word processor (Document mode), by pressing <F9> and selecting /Window Create. Then type in "DOCUMENT" as the name of the window, select Document as the window type, press return to select the default window layout (full screen), select Restrict Range and press

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the <Esc> key. Then move the cursor to I1 and press the <Tab> key, expand the cursor to highlight the range I1..I100, press the return key and then select the Quit option.

You should now have an empty word processing area to start typing in your letter. To finish off the letter you should press <F10> Page to provide automatic pagination during printing.

Now to input the formula into the form letter, return to the Sheet mode and type in the following:

I5 @NOW
I7 +B38&" "&C38&" "&D38&","
I8 +E38&","
I9 +F38&". "&G38&". "&H38&"."
I11 +"Dear "&B38&" "&D38&","

The formula in cell I5 places the time and date into this cell, which should be formatted to display this information in the desired manner.

The formulae in the other cells link all of the appropriate fields from the database. As each record is selected the details will be passed into each of these. Symphony permits formulae to use string arithmetic, which is the heart of this application. Therefore we do not have to resort to macros to perform label arithmetic, as was necessary with Lotus 1-2-3.

To produce a series of form letters we must tell Symphony which range is required as our Main Report range. To do this (you should still be in Sheet mode) press <F10> Query Settings Report Main. Then press the <Esc> key, move the cursor to I1 and press the <Tab> key, then move the cursor to the bottom of the form letter. Having highlighted the letter, it can be selected by pressing the return key. To return to the worksheet you need to press Quit three times.

Now to set up the print-setting sheet,

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select <F9> Print Settings Source Database Main Quit Quit, which makes the database setting sheet "Main" the printing source. This is the sheet for which we previously altered the main report range, which is now the form letter. Before printing the form letters a criterion for printing should be selected.

To select the clients you wish to send letters to, select the Main window and display it on the screen with <F9> Window Use Main. Now switch the work environment back to Form mode with <Alt>-<F10> Form. The database form should now appear on the screen and it is possible to move from record to record using the <PgUp> and <PgDn> keys.

To select the records for printing set up a criterion with <F10> Criteria Edit. Enter a number one in the P.KEY field and press the return key to enter it into the cell. To enter it as a criterion, press the <Ins> key, then press <Esc> and select Use to enable that criterion to be used.

Now make the Document window the current window (as the settings of this window will be used for the printing), then select <F9> Print Align and Go to start the printing. All of the form letters should now be printed, each starting on a new page. If you are using A4 paper you will need to alter the page length to 72 lines so that each letter starts at the top of the page.

This is a simpler and less time-consuming solution to the problem than that provided by Lotus 1-2-3, and it highlights some of the many additional features that Symphony has.

Barry Roberts is the principal of Practical Software in Melbourne, and editor of the Lotus Association newsletter.

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THE VIRTUAL DEVICE

MYTH OR REALITY?

The new IBM graphics hardware has finally reached Australia, along with some special support software. David McCune describes the GKS and VDI standards.

The past year has seen an explosion of inexpensive, high-performance graphics peripherals in the PC marketplace, but the graphics software to drive them has come slowly. One serious impediment has been the lack of a standard way for programmers to interact with the wide variety of printers, plotters, monitors, and other graphics output devices now on the market.

The commands that draw a green square on one plotter are likely to produce nonsense on another. Application programmers must write custom device drivers (specific hardware control programs) for each printer, plotter, or graphics board they want to support. As a result, most graphics software works with only a few of the many available graphics peripherals.

It would be in everyone's interest — programmers, peripheral manufacturers, computer vendors, and end users — to formulate a standard way for graphics programs to send commands to different devices. A number of graphics standards have been vying for recognition in the past several years.

One standard, the North American Presentation Level Protocol Syntax (Naplps), defines a compact scheme for storing graphics information for telecommunications and display, as an alternative to the Prestel standard. These are both widely used by videotex systems to transmit graphics between computers, but that standard is intended primarily for use with graphics monitors, not printers, plotters, or input devices.

Another popular standard for the IBM PC is the Halo Library of graphics subroutines and device drivers. Halo allows programmers to develop graphics software for many of the video boards, printers, and plotters available for the PC.

The Graphics Kernel System

Perhaps the most popular graphics standard is the Graphical Kernel System (GKS). GKS evolved in Europe in the 1970s and is now gaining wide acceptance in the United States. Like Halo, GKS is a programmer's interface that encompasses a large set of subroutines that can be called from various high-level programming languages to draw graphics.

For example, the GKS function **Polyline** (N,X-Coords, Y-Coords) draws a set of joined lines between the N points specified in the X and Y co-ordinate arrays. Using GKS, a graphics program activating the Polyline function will always draw a set of joined lines, regardless of whether the computer is a PC, an Apple or a mainframe.

A GKS implementation consists of two major parts — a graphics library and drivers for the most popular graphics peripherals. The GKS library's standard set of subroutine calls, known as a language binding, ensures that source code can easily be moved from one computer to another.

The GKS drivers translate the GKS subroutines into commands that can be understood by individual peripherals. With GKS, the programmer does not have to worry about whether the Polyline is being sent to a Houston Instrument plotter, an Okidata printer, or any other output device for which GKS provides a driver.

Thus, programmers call GKS subroutines, which in turn call the device drivers. GKS is never aware of the hardware details of the specific graphics peripheral being used but instead sends its data to an imaginary, or virtual, device. The

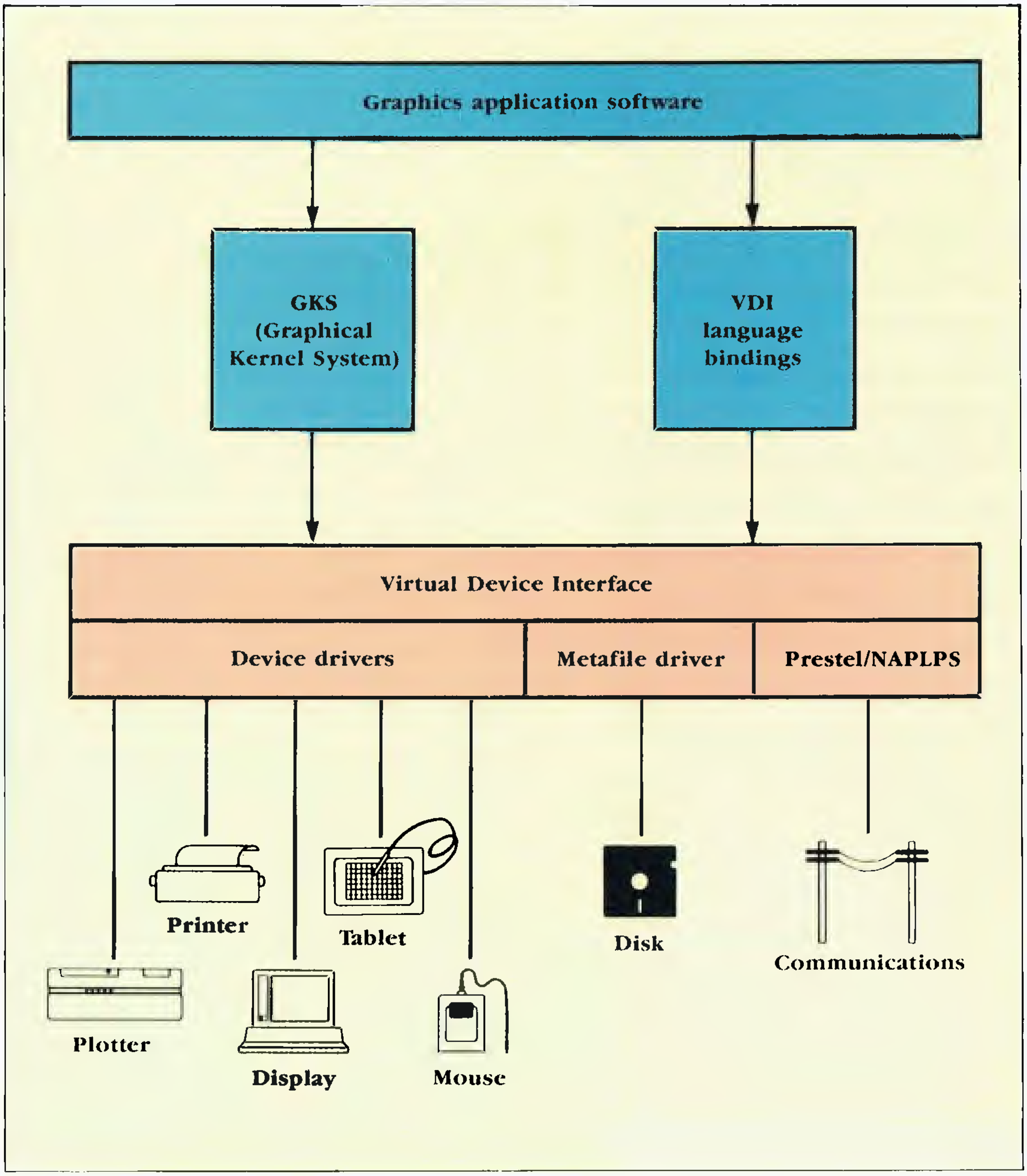


Figure 1: Programmers have the option of using the full GKS system or just the VDI subset.

drivers provide the interface between the virtual and physical devices.

The Graphical Kernel System planted the first step toward the programmer's dream of writing graphics software without having to deal with the specifics of output. But GKS routines tend to be slow and take up considerable program space, and some programmers prefer more immediate control over the output drivers. In theory, any graphics program — even those using non-GKS subroutines — can call peripheral drivers individually.

This is similar to a programmer circumventing MS-Dos and calling IBM PC BIOS subroutines directly. Since the programmer's path to the hardware device is more direct, the result is usually increased program speed.

But direct programming access to specific drivers presents some problems. The more devices you want to support, the more programming is required, resulting in product delays and higher costs. Also, since computer peripheral technology is advancing at an accelerated rate, last year's printers may not be selling next year, making a program's list of drivers obsolete.

The virtual device interface

Undaunted in the quest for the virtual device, software developers have searched for an alternative — a separate programming interface that would allow programmers to send some graphics information directly to a standard set of drivers without incurring the cost in speed and program size that comes from using GKS. In other words, programmers would have a subset of GKS that they could use to interact with the drivers (see Figure 1). This set of subroutine calls, known as the virtual device interface (VDI), appears to have become a reality.

The American National Standards Institute (Ansi), which standardised Naplps and is about to standardise GKS, is now preparing a draft VDI specification. Like GKS, VDI will include standard sets of language bindings so programmers can write portable VDI programs in C, Pascal, Basic, and other high-level languages.

Ansi's attempt to standardise GKS and VDI does not amount to an endorsement of these systems, But IBM recently endorsed GKS and VDI, and it now recommends that graphics applications communicate with the PC via those standard interfaces. That in itself may make GKS and VDI de facto standards.

> ***GKS routines tend to be slow and take up considerable program space, some programmers prefer more immediate control over the output drivers.***

At the same time IBM announced its new PC graphics hardware (see "IBM's New Graphics Hardware"), the company said it would distribute a version of GKS, called the GSS-Toolkit Kernel System, and an implementation of VDI, called GSS-Drivers. Both versions were written by Graphic Software Systems (GSS).

GSS is in a good position to influence the Ansi standardisation process. Currently, the software company offers the only VDI implementation for the PC, and IBM, which endorses the GSS version of VDI, has far more influence over microcomputer standards than Ansi.

GKS and its subset, VDI, can be thought of as graphics operating systems. Just as Dos has a command interpreter that lets the PC understand English-like commands, GKS and VDI have language bindings that enable programmers to enter English-like calls to graphics subroutines. The graphics system translates the high-level commands into data, fetches the appropriate device driver, and passes data to it.

GSS divides its VDI functions into six categories: control, output, attribute, input, enquiry, and I/O. The object of most VDI functions is a virtual device that GSS calls a workstation. The first VDI function must be Open Workstation, which opens an I/O channel to a particular device.

The programmer specifies what kind of workstation device should be opened by referring to the generic labels Display, Plotter, or Printer. Once a workstation is open, the programmer sends graphics information in the form of VDI function calls, which pass parameters to specify variables such as line type, line color, marker type, fill style, and text color and font.

At that point, VDI must choose the correct device driver for the virtual workstation. When the end user boots up a graphics program with GSS-Drivers, the virtual device interface and one or more of the drivers chosen by the user are loaded into memory. VDI then assigns each of the drivers to one of the generic device types. When a program tries to send data to a Display workstation, VDI uses its internal logic to figure out whether any of the drivers that are loaded with the graphics program is of the Display type. If so, the program sends its output to the particular driver.

If the user wants to send Display output to a printer, he or she can use Dos's SET command to override the default type assigned to a driver. For example, the commands

```
SET DISPLAY = DIAB150.SYS
SET DIAB150.SYS = LPT1:
```

instruct VDI to redirect all output

destined for Display workstations to the parallel port instead and to use the Diablo 150 ink jet color printer driver. All of this can happen without changing the application program. The end user can instruct a VDI application to switch its output to any of the devices for which GSS supplies a driver — and the programmer had to write the output logic only once.

Once a software package starts using GSS implementations of VDI or GKS, it is limited to using only graphics devices for which GSS provides drivers. In the VDI C-language binding manual, GSS lists 29 device drivers; almost all of those are printers or plotters. One mouse and two tablets are also included. But the only GSS-supported video controllers are the IBM Color/Graphics Adapter and the two new IBM color boards: the Enhanced Graphics Adapter and the Professional Graphics Controller. This limitation is one of GSS's major weaknesses.

None of the popular high-resolution controllers, such as STB, or Conographics, is supported. But, now that IBM has endorsed the VDI concept, many video controller vendors may take the plunge and pay GSS the fee for writing a driver for their graphics boards.

GSS also supplies a driver for "metafiles". Somewhat like the Naplps code used in videotex, a metafile provides a scheme for storing and telecommunicating graphics information. Once a graphic has been encoded and stored as a metafile, it can be transmitted to other computers that use the same procedure. (A Virtual Device Metafile standard is also under Ansi review).

If the VDI standard catches on and remains stable, hardware vendors may take the gamble of burning VDI into the chips that run their products. VDI in firmware would eliminate the need for device drivers, resulting in lower costs and faster execution.

The problem with output

For the most part, the GSS implementation of VDI provides a pleasant and efficient graphics programming environment. The level of peripheral independence provided by VDI should vastly reduce the amount of time graphics programmers spend on developing applications.

VDI is superior to GKS in several areas. Since VDI uses only integer arithmetic for its co-ordinate calculations, it tends to draw objects much faster than GKS, and the code is more compact.

The level of peripheral independence provided by VDI should vastly reduce the amount of time graphics programmers spend on developing applications.

Even more important is VDI's Rubberbanding feature. When you begin to draw a line with VDI, you establish the beginning point.

As you move the cursor, you can stretch the line between the first point and the cursor until you find and set the final endpoint. This is an extremely valuable feature for developing interactive graphics.

Yet the true virtual device remains more myth than reality. The programmer must still be aware of differences between peripherals.

A graph that depends on color for clarity might display correctly on a number of different four-color plotters but appear nonsensical on a black-and-white printer. VDI's internal logic does its best to translate graphics commands destined for one device into the language of another, but the output often misses the mark.

For example, when Open Workstation is called, VDI returns a large amount of information about the device that was just opened, including the number of available colors. The application program has to read that data and adjust its output accordingly — for instance, by drawing a black-and-white dotted line instead of a red one. But, the greater the differences between peripherals, the more the translation becomes guesswork.

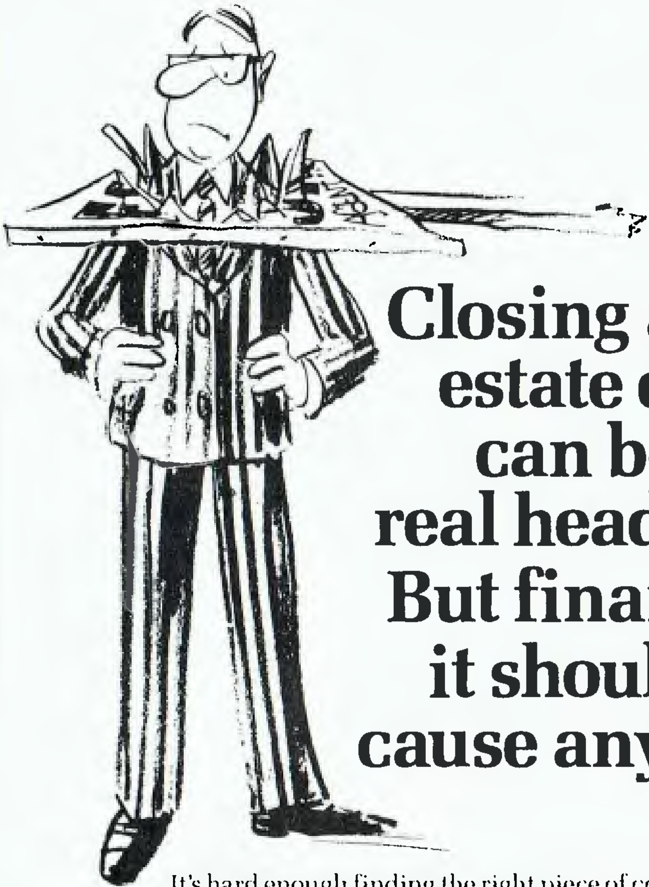
GKS, on the other hand, has a provision for defining "attribute bundles" for various workstations. A system manager can define all the attributes that will define polyline, type 1 to mean a solid red line, but the bundle for another plotter could define it as a dotted black-and-white line. VDI lacks this advanced feature.

Another major GKS feature missing from VDI is the "segment" concept. A segment is an in-memory storage area where graphics can be temporarily stored. Segments can be written to one or more workstations and then moved, rotated, scaled, and erased with a single command.

Furthermore, the VDI co-ordinate system is less sophisticated than that of GKS, VDI assigns all graphics co-ordinates to an imaginary display area 32,767 units square. The device driver then maps the square on to the physical display.

GKS has a similar, yet far more complex, concept. GKS users can define their own imaginary "world co-ordinate" system instead of accepting the established grid. The GKS device drivers then convert the world of co-ordinates to the physical device.

Even more important, the imaginary world co-ordinate system can be mapped on to another imaginary "unit screen" that



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measures 1.0 units on each side. With this normalised device co-ordinate (NDC) system, GKS lets you map the world co-ordinate system to a portion of the NDC screen.

A 1000-by-1000 world co-ordinate system could appear in an area measuring .25 NDC units on each side, or one-quarter of the screen.

This is called an NDC view-port. You can also map a portion of the world co-ordinate screen on to the NDC display area, so you can "zoom" in and make one-fourth of the original graphic occupy the full NDC display area.

Although GKS may seem awkward and slow to some programmers, features such as attribute bundles, segments, world co-ordinates, and NDC view-ports may keep them from switching to the scaled down VDI. As with any software program, speed and ease of use often exact compromises in functionality.

Trapped in the past

While the virtual device interface gains much of its stature from the fact that it is being standardised by Ansi, the standards bureaucracy could also inhibit its future evolution. Drafting, reviewing, and officially adopting the standard will take years. Meanwhile, technical progress in graphics hardware and software could make much of the standard obsolete.

As an example of this problem, neither GKS nor VDI provides any facilities for working with three-dimensional objects. As faster and more powerful micros make 3-D graphics work more feasible, this weakness will become more pronounced. Ansi is now reviewing possible 3-D extensions to GKS, but there is no firm date when these extensions will be available.

Furthermore, it is likely that many of the functions now offered by GSS will not be supported by Ansi, and

IBM'S NEW GRAPHICS HARDWARE

IBM's two new graphics boards and monitors are neither technological nor price breakthroughs. But they may have just as large an impact on the confused microcomputer graphics market as the PC had on microcomputer hardware and software.

IBM is targeting two markets. The Enhanced Graphics Adapter and the Enhanced Color Display should attract business users who now feel constrained by the limited color and poor resolution of the PC Color/Graphics Adapter, or those who desire high-resolution text and color graphics using a single monitor. The far more expensive Professional Graphics Controller and Professional Graphics Display are aimed at graphics-intensive applications.

Graphics has always been one of the PC's weak spots. Users who have wanted to display high-quality graphics have had to buy graphics boards from third-party vendors.

But only a few of those enhanced graphics boards are compatible with each other or with common software. Programmers have had to write new versions of their applications for each board. The result has been an excess of boards and a paucity of programs that make good use of them.

IBM has finally made its move and will almost certainly impose some order on the graphics chaos. In so doing, it will probably sweep away much of the competition, which is likely to be incompatible with the new products. On the other hand, IBM may save some of its competitors by embracing the VDI and GKS standards described in these pages. If the other graphics board vendors produce VDI drivers for their products, programmers will be able to move their programs from IBM's boards to other graphics boards more easily than is now possible.

The IBM PC Enhanced Graphics Adapter provides 16-color graphics in both 320-by-200 medium-resolution and 640-by-200 high-resolution modes. With the addition of the IBM Graphics Memory Expansion Card, which adds an extra 64K-bytes, the new color board can display 640-by-350 extra-high-resolution graphics in 16 colors on the Enhanced Color Display. Graphics memory can be increased to 256K-bytes. The extra memory can be used for smooth scrolling, panning, animation, storage of customised character sets, and additional "pages" of video images.

IBM can now legitimately claim to display high-resolution text in color. The Enhanced Graphics Adapter provides an 8- by 14 character cell, compared to the current color graphics board's 8-by-8 cell. When used with the Enhanced Color Display, the board supplies a palette of 64 colors from which you can select the 16 display colors. A light pen can also be used with the new board.

The Enhanced Graphics Adapter was designed to be used with the Enhanced Color Display, but you can also display standard high- and low-resolution graphics on the old Color Display and 640-by-350 bit-mapped graphics on a standard IBM monochrome monitor.

The Enhanced Color Display is a major improvement over the current IBM color monitor. IBM has improved resolution dramatically by reducing the size of the dots that make up screen images to .31mm. To handle the extra high resolution, the Enhanced Graphics Adapter drives this display at a scan rate of 22 kHz.

At the high end of the market, IBM offers the IBM PC Professional Graphics Display. The controller provides a high-resolution, 640-by-480, color-mapped display.

You can display 256 colors simultaneously, choosing from a palette of 4096 shades. To speed graphics processing, the board contains its own 8088 (the same microprocessor that powers the PC) and quite a bit of drawing intelligence in firmware. Builtin features include two- and three-dimensional graphics manipulation, line and polygon drawing, polygon filling, programmable character sets, and the ability to rotate and scale graphics.

The Professional Graphics Controller provides 300K-bytes of Ram for display data and 20K-bytes for display lists (picture descriptions) and internal program work space. Other features include a 16- by 8-pixel character cell in color graphics emulation mode.

IBM says it knows of no popular PC graphics programs that do not run on the Professional Controller, but unlike the Enhanced Adapter, the high-end board requires an expensive analogue RGB monitor and will not run with the old PC color monitor.

The new Professional Graphics Display is an analogue RGB monitor, which means that the red, green and blue video signals can vary smoothly from weak to strong. When combined, these signals can produce an almost infinite variety of colors, unlike the limited range provided by cheaper, so-called "TTL" or "direct-drive" RGB monitors.

Considering the high price of the Professional Controller and Display, they should be considered only by those who do intensive graphics work, particularly anyone who does Cad/Cam projects in which speed is a major consideration. But, the Enhanced Graphics Adapter and Display should provide strong competition for the majority of graphics boards on the market today.

The Professional Graphics Controller on display at Unixworld Expo 85 in Sydney.

Photography: Graeme Gillies

vice versa. Even the name VDI is about to change to CGI (for Computer Graphics Interface). The specific language bindings will likely differ also from those now available. Thus, programs written for today's VDI will probably have to be modified significantly during the coming two years.

If the companies that sell implementations of standards do not offer extensions to their products until the standards are officially modified, programmers will be tempted to leave the standards behind. Despite IBM's endorsement of VDI, other graphics environments for the PC, such as Halo, still have a future.

Halo remains attractive to programmers for many reasons, one of which is the large selection of graphics boards that it supports. In the long run, the graphics system that can evolve the fastest may be the one that prevails.

> **Many claim that these standards will liberate graphics programs from hardware dependence and make graphics programming truly efficient and lucrative.**

Somewhat prematurely, the VDI and GKS standards are being touted as the salvation of computer graphics. Many claim that these standards will liberate graphics programs from hardware dependence and so make graphics programming truly efficient and lucrative.

VDI and GKS are important milestones, to be sure, but they are not the end of the journey. While there are many good reasons to use either GKS or VDI for graphics programming, there are also many good reasons to avoid them — at least for now. PC

David McCune is president of a consulting company.

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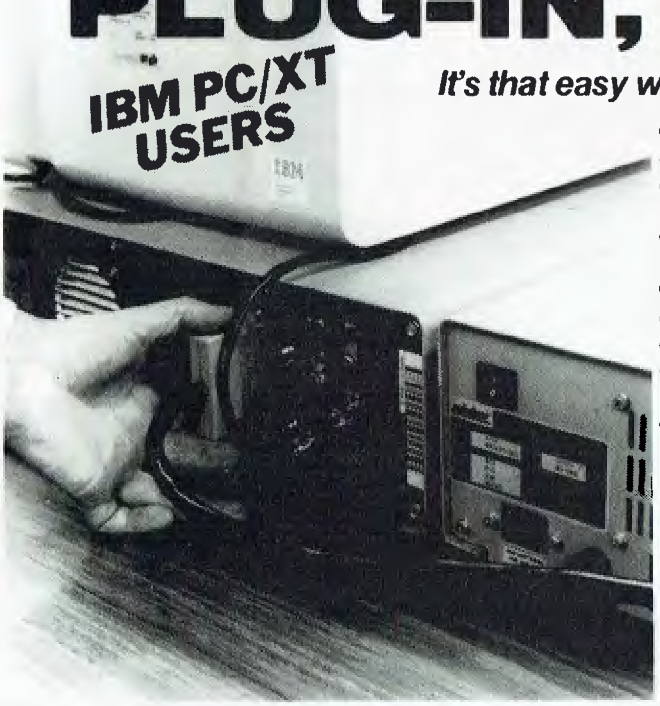

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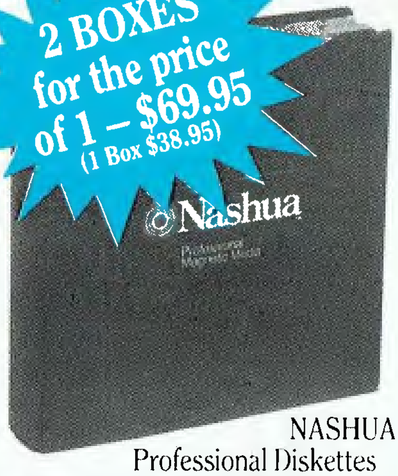

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EPSON'S LOW-COST HI-80

With the proliferation of PCs with inbuilt graphics capabilities and the popularity of software using graphics, there is an increasing demand for cheaper and better plotters. Epson, noted for its cheap, reliable printers, has now stepped into the plotter market with the HI-80 plotter.

The HI-80 also features a printer mode, which allows the plotter to act as a printer. When printing the HI-80 actually *draws* each character. This is a slow process, producing characters at less than 10 characters per second. As the average typist can exceed this speed, there is no way that the HI-80 could substitute for a real printer. The printer mode could be used for occasional printing, or as a dual-purpose companion to a portable computer.

Plotters can be used to produce diagrams and pictures by drawing each line in turn. The mode of operation is different from that used in printers where the individual characters are produced from a series of dots. Because a printer requires that the dots be printed from top to bottom and left to right, producing drawings on printers has always been a slow operation. Drawings on plotters can be produced feature by feature, without worrying about the order. This makes it easier to produce exactly the right presentation.

The HI-80 accepts standard A4 paper for its diagrams. This size is the same as a page of this magazine, making it quite suitable for business charts and graphs. Good business charts concentrate on making one point only, and do not need to be complex or large. In fact, the less detail the better, as the viewer's attention is focused on the main point of the presenter's argument. Thus there is no need to make the plot any larger.

Using oil-based pens, the HI-80 can also produce overhead transparencies, whose neatness and bright colors will improve any presentation.

Engineers will find little of interest in the HI-80, as engineering diagrams and drawings usually contain a lot of information; cramping this information into one small sheet leads to confusion and omissions. Scientists, however, may well find the HI-80 quite suitable for plotting experimental results, where the trend of results is more important than the actual detail of each experiment.

Optional extras

Three important options are available for the HI-80, which should not be overlooked.

The first option is the addition of an 8K-byte buffer. This allows the computer to send plotting information to the HI-80, freeing it for other processing. This option also allows you to define your own character sets for plotting and printing text. Thus one could define a set of Greek or Japanese characters and send personalised letters throughout the world. Epson does not provide details of these

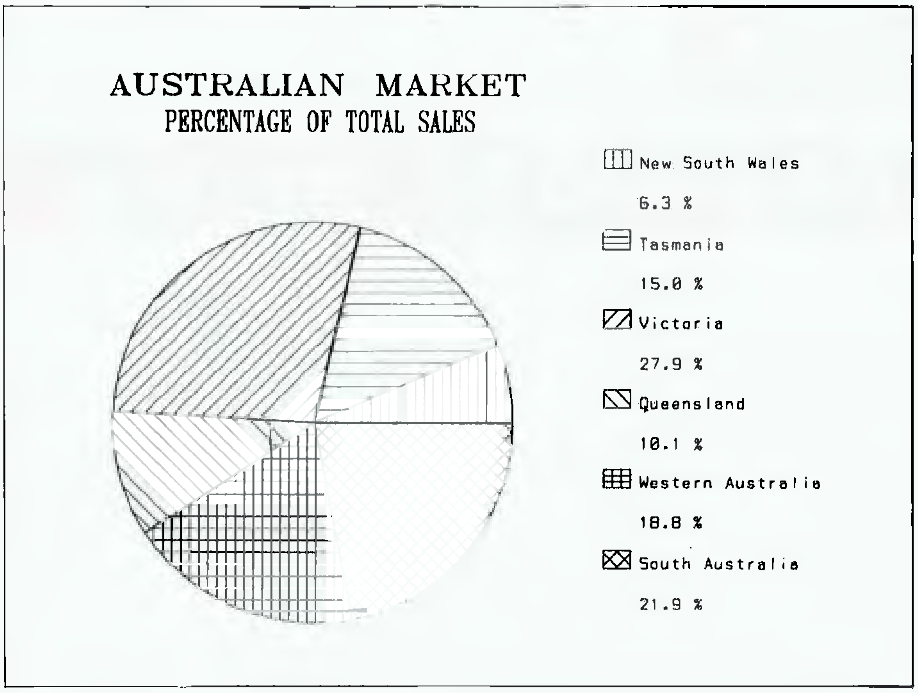

Figure 1: The Epson HI-80 plotter automatically performs hatching of pie segments.

alternative fonts, but I am sure that they will soon be readily available.

The second option is a serial interface. This interface is identical to that provided for the RX and FX series printers. Users with older micros, or with a printer already attached to the parallel port, will need this option.

The third option is a Rom chip which allows the Epson to emulate the Hewlett-Packard HP-7470 Plotter. This is made available for those users with existing software set up for the HP range of plotters. The emulation chip means that this software should run immediately on the Epson. In some instances it will be necessary to purchase the serial interface option, as little existing software will expect the plotter to be on the parallel port (despite a statement to the contrary in the manual).

Some important compromises are made in the emulation. First, once in HP plotter mode it cannot be switched out of that mode. So if a document is to be printed, DIP switches must be changed, and the power switched off and on again. The function of the control buttons is changed once in the HP mode. These are not used often, but when they are, you will need to refer to the manual, as the function of each button is not obvious.

Installation of the options requires little more than time and careful attention to the manual. It took me some time to ascertain that my RS-232 cable needed a further connection; it took even longer to get all the DIP-switch settings right.

Setup and initialisation

Setting up the plotter in its standard form is straightforward: simply remove the plotter from its case, drop the pens into the carridge, plug it in, attach it to your PC with your printer cable, and away you go.

At power-on the HI-80 goes through a test routine which checks the size of the paper, and moves it down about 5mm. Switching the power off and on again will move the sheet down a further 5mm and out of the range of the rollers. I soon learned to remove each sheet as it was completed, and only insert a new sheet when required.

Some computers (such as the IBM PC) re-initialise the printer on powerup. This restarts the test routine in the HI-80, so the manual recommends that the printer be turned on *after* the computer. Also noted in the operating manual is the fact that some software packages initialise the printer each time they are loaded. So switch the plotter on only when you want it.

The HI-80 is easy to use directly. As the plotter is attached to the printer port, simply LPRINT the appropriate commands from a Basic program. The commands available range from simple Move and Draw commands, to automatic hatching of pie segments (see Figure 1).

Epson provides three different forms of commands. The first is ESC/P, a new operating standard which Epson hopes will be adopted by others. The second is that used on the Watanabe (or Graftek) plotters. The third (optional) form is that used on the HP-7470.

I tried each set, and found that they worked satisfactorily in most instances. A command is provided in both the ESC/P and Watanabe sets to switch from one to the other, and to switch to printer mode. There is also provision for switching to the HP mode, but not for switching back.

The plotter was also operated with software packages designed for the HP-7470. GrafTalk, a specialist charting program, worked well once it was installed properly. The illustrations to this article were produced with GrafTalk. Tests were also carried out with Lotus 1-2-3.

AutoCAD, an engineering drafting package, worked well,.producing plots of sufficient clarity for most purposes. If a particular application of AutoCAD only required the production of schematic or simple layout drawings, it might be practical to use this plotter with AutoCAD, but in normal circumstances a larger plotter would be required.

Pens and Paper

Critical to the production of first-class graphics is to be able to match pen, paper, and speed of drawing. The plotter is supplied with four ballpoint pens. You can also purchase fibre pens and oil-based pens for overhead projection transparencies.

The ballpoint pens produce a thin (0.1mm) line suitable for direct reproduction. The fibre-tipped pens produce a thicker line which is better for filling areas with solid color. Both types of pen work well on ordinary bond paper (such as used in plain paper copiers). The ballpoint pens work best with thicker bond paper; it is worth experimenting with different weights of paper before settling on a particular type.

The ballpoint pens will not work on art paper, so graphs produced with them might not be quite suitable for reproduction. Only one line thickness is allowed, which

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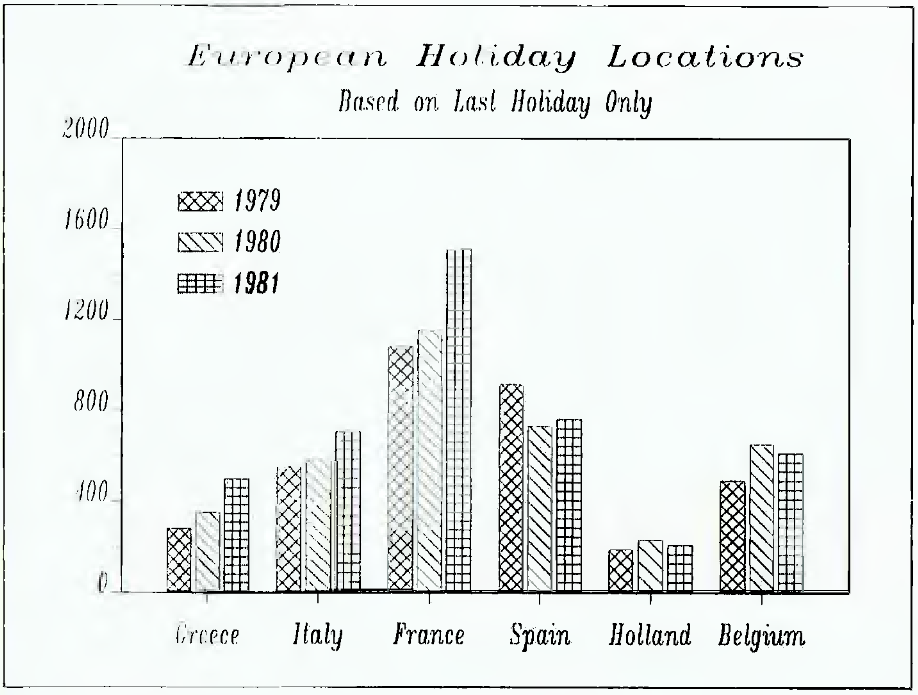

Figure 2: The HI-80 displays a multitude of fonts and can function as a printer.

means that important lines must be drawn several times with slight offsets if the correct emphasis is to be achieved.

The pens have a limited life, and the user must accept that he will need to buy a stock of pens if the plotter is to be used with any regularity.

Performance

The HI-80 works quite well with single sheets of paper. It is easy to load, as long as the paper is carefully aligned with the bar on the platen. DIP switch settings allow the use of different sizes of paper. One setting corresponds to the US letter size, while the other setting requires you to nominate the size at startup. For A4 paper, the down-arrow switch must be pressed before operating the plotter. There is no advantage in using continuous stationery, as the paper must be reset and the On/Off button pressed after each plot or page of printing.

Paper is secured in the plotter with two knurled steel wheels and hard rubber rollers. These wheels are similar to the "grit" wheels used in many other paper-moving plotters. When plotting, longitudinal movement is achieved by moving the paper, with horizontal movement achieved by moving the pen. The accuracy of these two completely different mechanisms was tested by drawing a number of small circles. All circles so produced were within the manufacturer's tolerance, and of acceptable quality for normal applications of the plotter.

The HI-80 does not have a mechanism to record whether the paper has been changed. This means the user should end every plot with a command to move back to the top of the paper and cap the pens.

The maximum specified speed of the HI-80 is 230mm/sec. This is about half that of the HP-7470, but sufficient for most applications. In many applications the absolute maximum speed is only one of a number of factors affecting the speed of production, and a faster, more expensive plotter may not necessarily save the additional capital cost.

In some instances the user will want a slower plotter anyway. Slowing down a plotter usually produces a higher quality drawing, especially where areas of solid fill are to be drawn. Slowing down can also extend the useful life of pens, although at the price of pens I would throw them away once they started to wear out. The HI-80 has a command to halve the plotting speed.

The HI-80 uses stepper motors to drive the two axes. These are cheap and reliable, but produce jagged lines when drawing on a slope. The stepper motor resolution is 0.1mm per step, so the steps are just visible. Once the fibre-tipped pens start to wear out and produce thicker lines, the steps become less noticeable. For most applications the steps in the lines are acceptable. If better quality is required, better plotters are available, but they cost more.

Accuracy is stated to be better than 0.3mm with the same pen, or 0.5mm with a different pen. My testing showed that the test machine performed well within these tolerances. Problems with accurancy tend to show themselves in pie charts where the sides of adjacent pies must be accurately positioned. The better application packages have a facility to shrink the size of each pie segment if this proves a problem. Thus problems with plotter quality can be overcome by better software.

Documentation

The operating manual is a comprehensive reference document, with separate details of the commands and useful summaries in appendices.

The installation instructions could be a little clearer (judging from my experience). There are plenty of warnings about the traps with different installations, so do not despair if it does not work first up.

Examples of use of the commands are brief and to the point, and illustrated where required. The use of the plotter can be learned in one afternoon by sitting down with the manual and trying each statement in turn with LPRINT statements.

The manual includes illustrations of simple applications. These are not particularly useful or generally applicable. It is suggested that purchasers use the money saved on the purchase of the plotter to buy a decent business graphics package to drive it.

No information is provided on servicing the plotter, except "Should any problem occur, contact your Epson dealer as soon as possible." I suggest that purchasers keep the first "self test" plot for reference, and check this against later tests if there appear to be any faults in the plotter.

Conclusion

The Epson HI-80 is a reasonable, cheap plotter. It performs the plotting operations with a minimum of fuss. The different modes of operation mean that it will probably work with your software. However, you should test the plotter with your software before purchasing.

As a printer, it is too slow for practical day-to-day usage, but this feature is useful for emergencies or work at home where the number of pieces of equipment to be carried is more important than speed. PC

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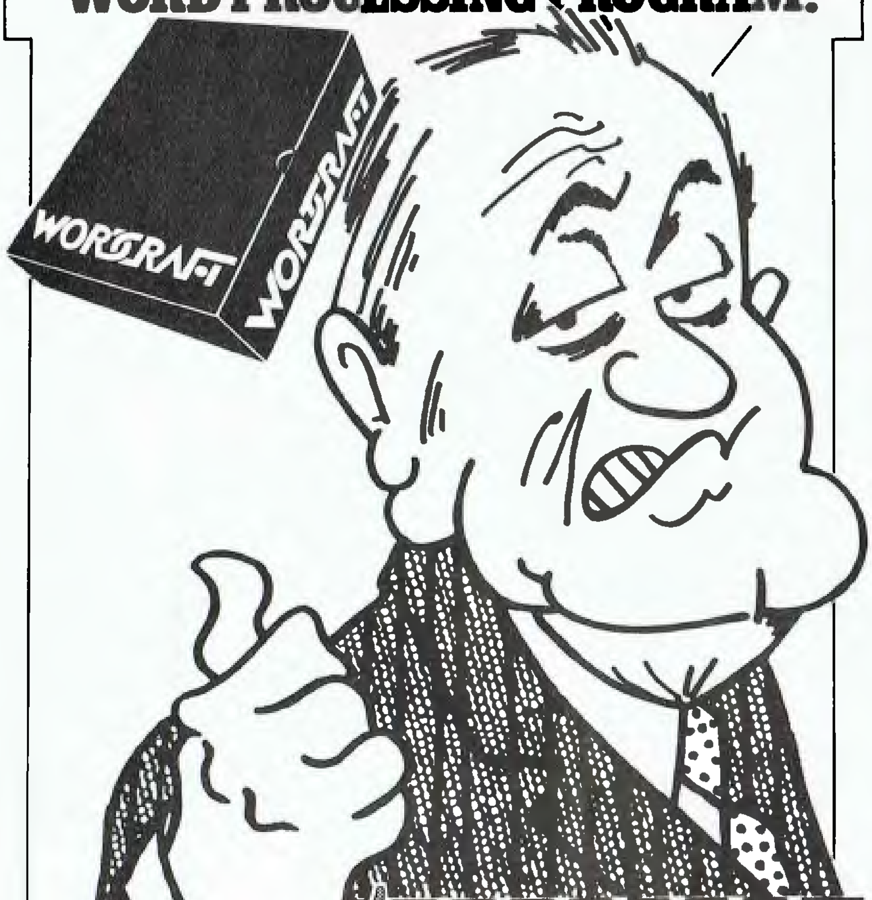

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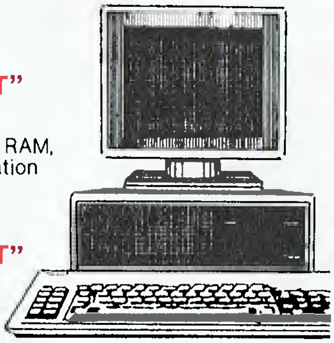

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EACOM MULTILIST ACCESS THROUGH AGENCY PCs

Searching for a home has traditionally been a tiring and time-consuming exercise, fraught with hazards such as over-aggressive salesmen and overnight price fluctuations. The EAC (Estate Agents Co-operative) Multilist system, recently launched in Sydney, claims to solve many of the problems inherent in house-hunting, by maintaining property records on a central mainframe system which can be accessed (or updated) any time through PCs in real estate agencies.

EAC hopes the system will appeal to similar organisations in other States, and eventually lead to nationwide online real estate coverage. Property information was previously despatched to EAC by courier and entered by batch processing, where 300 additions and 1500 amendments were made each day, on a "live" database of 25,000 property listings, and a historical database of over 35,000 sales.

As the system grew it became cumbersome and harder to control, so EAC put out a tender for an improved system, using PCs as nodes and more effective communications links. The job was won by Innovak Computing in Sydney. The final Eacom system took two years to develop and is based on the Gateway package, running on IBM hardware.

In addition to the IBM System 38 mainframe for the multiple listing facility, the Eacom system includes a System 34 which is used to provide a property management bureau service, and and IBM Series 1 system, which acts as a front-end communications processor.

The Gateway software allows standard dial-up access for estate agents in the metropolitan area, and X.25 packet-switching facilities for country-based agents, as the cost of STD or leased-line connections would be prohibitive. Access to the Eacom Multilist system is also possible through dumb terminals and minicomputers, as well as through PCs.

EAC also offers the Eacom residential property management system for the PC XT and compatibles, which enables an agent to keep track of a number of properties, tenants and associated landlord and trust accounting. Future software will include packages for strata property maintenance, holiday letting and commercial/industrial property management.

For those real estate agent members of EAC who have not yet purchased a PC of some variety, the company offers the Eacom PC package — a re-labelled Televideo XT with appropriate software. This system is progressively being installed in over 100 EAC offices in NSW. As EAC comprises more than 1000 agents as members, the potential for sales of the Eacom PC is immense, and the resulting network would be one of the biggest of its kind in Australia.

—IAN ROBINSON

The Eacom PC is a re-labelled Televideo XT which provides access to the EAC Multilist database.

INTEL ABOVE BOARD BOOSTS PC STORAGE

Intel Corp has announced a memory board that promises to change the competitive picture for many software packages dramatically. Intel's product, called Above Board, circumvents the 640K-byte memory limitation of PC and MS-Dos, allowing use of up to 4M-bytes of random-access memory. In tandem with Intel's announcement, Lotus Development Corp will announce new versions of Lotus 1-2-3 and Symphony intended to make use of the newly available memory. Comparable changes have also been implemented in Ashton-Tate's memory-hungry Framework integrated package.

Above Board is an add-on memory board for the IBM PC and PC AT that makes it possible to use bank-switching to access the additional memory. One source estimates that 4M-bytes of memory would yield about 500,000 cells in a spreadsheet.

Mammoth spreadsheet files, however, are not the only use foreseen for Above Board. Intel and its new product are at the centre of a consortium of hardware and software developers intent on expanding the appeal of memory-intensive software.

Lotus Development Corp has been closely involved in the development of the Intel board, which conforms to a standard supported by both companies called the Expanded Memory Device Interface Specification. Lotus is expected to make the specification publicly available to product developers, to encourage modification of products or development of new ones. But the specifications and circuit diagrams have already been quietly circulated among third-party manufacturers, some of whom have disclosed the details anonymously.

Microsoft Corp reportedly had a hand in developing the specification too, and may be marketing the board for Intel. Microsoft officials were not available for comment.

The product is coming from a newly formed division at Intel, the Personal Computer Enhancement Operation. Intel, a $US1600 million circuit maker founded by one of the inventors of the integrated circuit, produces the 8088 and 80286 microprocessors at the heart of the PC and PC AT. Intel has the majority of the 16-bit chip market, but until the founding of the new division had never been involved in retail sales.

The new division, a tiny, semi-entrepreneurial operation has its own public relations firm, separate from parent Intel. The division's first product, announced earlier this year, was a retail packaging of the Intel 8087 maths coprocessor chip. Two other products, code-named Survival and Memory, are expected to be released this year.

Above Board circumvents the 640K-byte memory limitation of PC and MS-Dos, allowing use of up to 4M-bytes of random access memory.

Lotus at the same time officially announced version 2 of its popular business standard, Lotus 1-2-3, and version 1.1 of its integrated business software, Symphony.

Existing programs cannot take advantage of Above Board without modifications to their memory-address routines. Sources say a program must look for an operating system device driver in the "CONFIG.SYS" memory management file on the disk along with the PC's operating system.

Intel is also preparing a mathematics coprocessor to accompany Above Board to speed recalculation and logic functions of spreadsheet software.

Sources outside Lotus and Intel question the rationale behind the release of a product such as Above Board. Only a very small proportion of PC users, they say, need to address 4M-bytes of random-access memory, and most of those users are so-called power users of spreadsheets. They also question whether a user can handle the massive spreadsheets that could be generated with such amounts of memory. A 4M-byte spreadsheet file would be so large as to be useless; no user could keep track of all the data stored there.

Power user David McGaffin, president of the consulting firm Datametrics, acknowledges the problems of massive spreadsheets, but predicts that the extra memory will be more commonly used as a memory disk, on which several related spreadsheets are kept so that files can be loaded quickly for swapping information between files. Swapping files on disk can be too slow. And he says that some users need the new board's memory, capabilities "unequivocably. No question about it."

Other users point out that one of the difficulties with Symphony is that the larger program size results in smaller data files; Symphony owners would welcome the chance to have more memory.

But others point to a world of software beyond spreadsheets, a realm that could easily make good use of immense memory. Marty

Alpert, president of Tecmar Inc says the market for Above Board is not limited to spreadsheet power users but includes "people who want increased efficiency from a PC," such as database users. One factor that can slow database use, especially in data-intensive operations such as sorting, is the constant need to go to the disk containing the data. It is common for even personal computer databases to exceed the several hundred thousand bytes of available memory in an ordinary PC. With Above Board, substantial databases could be loaded entirely into memory, even if only in the form of a massive memory disk, dramatically improving performance.

Alpert also sees Intel's move as "representing another opportunity for third-party vendors". Intel, he says, has excellent technology and is trying to leverage that technology in new distribution channels — the retail market, in which third-parties have been successful for years. Alpert predicts that Intel will be overwhelmed by competition from third-party vendors in this market. He did not say whether Tecmar would be developing a competitive board.

Walker Feigenson, marketing manager at Sorcim/IUS In San Jose, California, says his company will probably update Supercalc 3 to accomodate more memory from the Intel board or its competitors.

But he adds that bank switching, and the software jockeying such a method entails, will become obsolete when virtual operating systems are available for the IBM machines in future updates of PC- and MS-Dos.

— CHRISTINE McGEEVER

PC AT COMPATIBLES MARKET EXPLODES

Powerful PC AT clones represent a lucrative moving target for hardware developers. Future Computing of Dallas predicts that the IBM PC AT will account for two-thirds of the $US3000 million market in 1986, leaving $US1000 million for the clone makers. Chances are, the analysts say, clone makers are not going to be lonely.

In 1985, IBM is expected to sell 315,000 PC ATs worth $US1600 million in revenue. Comparable 1985 figures for the clone makers are about 90,000 units worth about $US500 million, according to Future Computing. High on the list of possibles may be Compaq, Corona, and perhaps Tandy. Honeywell, Wang and several others are also waiting in the wings. Tandy is thought to be negotiating with Tandon computers, but inside sources say that the company has its own internal development program.

Even Apple Computer may not have been immune to PC AT clone mania. At one time, Apple's strategy group was considering a PC AT clone packaged in a Mac enclosure.

Several European suppliers are also planning to introduce their PC AT clones this year, perhaps at the huge Hannover electronics show. Philips, Siemens, and Ericsson are some of the vendors expected to offer clones.

Clone and clone basic input/output system (Bios) makers all agree that IBM's Enhanced Graphics Adapter (EGA) will play a large part in the success of any AT clone.

In the rush to get IBM PC AT clones to market, manufacturers are racing to several companies for component parts.

One of the hottest commodities in today's research and development markets are little silicon slivers etched with instructions that, when coupled with an Intel 80286 microprocessor and other peripheral chips, make a system compatible with IBM's PC AT.

Building an AT compatible from scratch is not easy, nor can it be done quickly. Industry analysts agree; at least one man-year of programmer time is needed to write an AT clone basic input/output system (Bios). Given the demand for the AT's capabilities, the time necessary to get a system up and running and into the retail channel can mean lost revenue and difficulty recapturing market share.

"We foresee the introduction of a rash of clones," says Meg Lewis, a senior analyst with Future Computing. "The AT is likely to become a technology that others will follow. Most of the major manufacturers will have an AT-compatible computer on the market this year. The easiest way to get to market is to use a compatible architecture. Most of the players in the clone market are getting their Bios from one source, Phoenix Software."

Industry analysts agree at least one man-year of programmer time is needed to write an AT clone basic input/output system (BIOS).

Given manufacturers' need to get products on retailers' shelves quickly, there are numerous reasons for a clone maker to buy a Bios and/or an architecture from a company such as Phoenix.

"What we do very well is address the needs of our customers," says Neil Colvin, president of Phoenix Software, referring to those who want to build IBM PC, PC XT, or PC AT compatibles. Like virtually all vendors of AT-compatible basic input/output systems, Colvin is loth to discuss who his customers are. But analysts believe that Phoenix's customers and potential clients include AT&T, Kaypro, Texas Instruments, Tandy, Mitsubishi, and Corona.

Colvin reports that the demand for AT clones and clone Bios has increased "faster than we expected". He says, "to build a new machine from scratch, the customer has to make a number of key marketing decisions before he comes to us."

Colvin stresses that manufacturers must first decide whether they want to build a replica of the AT, whether they want a value-added product, or whether they want to integrate AT compatibility with a foreign architecture.

Firms such as Phoenix then go over marketing and compatibility issues with customers as they are making the basic technical design for the machine. Colvin says Phoenix has stock designs for motherboards, video boards, and other components. Sometimes the development process for clone makers is complicated by the use of foreign architectures (in which the machines uses a processor other than the Intel 80286). As long as certain basic hardware requirements are met, the use of stock Phoenix hardware designs helps manufactuers to get their products to market quickly.

"We are in business basically to reduce the amount of time it takes a manufacturer to get its products to market," Colvin says. "In some cases, we can deliver products in as little as 30 days."

At least one Phoenix AT clone

IBM's PC AT, recently launched in Australia, has spawned several compatibles.

customer gives the company high marks for its documentation and for helping to reduce his company's time to market. David Kay, vice-president of marketing for Kaypro says, "Phoenix has a high level of credibility in the market because of the way it develops its Bios. It uses double-blind development (in which groups of engineers develop code independently of each other), which ensures compatibility and reduces the risk of a potential lawsuit by IBM."

Phoenix reduces customers' fears of an expensive legal battle with IBM by offering a unique type of reassurance. "We are the only company that I have ever heard of that has taken out copy-infringement insurance on its Bios," Colvin says. "This means that if anyone ever sues us or our users, for our Rom (read-only memory) Bios, the insurance company pays the settlement.

Besides 3 feet of documentation. Phoenix also has sworn affidavits that its programmers have never seen the source code for IBM Roms. "We offered IBM a chance to look at our products, and it declined," Colvin says. "That is how confident we are about our Bios."

Phoenix is not the only vendor in the AT clone cookbook. Nara Technologies Corp offers an AT clone motherboard that makes extensive use of custom very-large-scale-integration chips. This product reduces the chip count on the motherboard to 38 from the 100-plus devices found on the PC AT. For companies buying in quantities equivalent to 1000 motherboards per month. Nara's AT clone motherboard is priced at $400.

Despite high interest in his product, Nara's president, Todd Morgenthaler, warns that, based on IBM's plans to introduce a smaller version of the IBM PC, some of the AT clone makers should be careful. It will not be cost-effective to supply AT clone motherboards with more than 40 devices on the board and without an IBM Enhanced Graphics Adapter.

Tomcat Computers has another perspective on the AT clone business. Tomcat PC and PC XT clones are sold overseas. Its AT clone, the Tomcat 3200 AT, will be its first entry into the US market, according to Tomcat US president, Ken Inouye. "Almost anyone can market an AT clone," Inouye says. "The real question is getting in to the market window on time."

Inouye emphasises that parts availability has hindered some clone suppliers. "I would say AT compatibility is about four times as difficult as PC compatibility," he says. "Until recently, it has not been easy to get all the parts that are needed to build an AT clone." Hard disks with fast access times have been especially difficult to obtain.

Tomcat concedes that it has not a licence for MS-Dos 3.1, but expects to enter in to relationships with Microsoft and Digital Research. "I think DRI's GEM and Concurrent Dos could be important in the (AT) clone market," Inouye says.

Future Computing's John Hemphill, said: "I think we will see a demand for larger disk drives. This is probably particularly true when the AT becomes more widely used as a file server. I would not be surprised to see an AT clone with a 40M-byte hard disk drive in the near future."

But clone makers believe the market for AT computers is not infinite and that the machine is not an end-all product. "Users are fickle," Colvin says. "If IBM introduces the PC II tomorrow, then there will be people who will come to us for a compatible Bios.

— JIM FORBES

IBM AUSTRALIA SHIFTS INTO TOP GEAR

After several months of uncharacteristic inactivity, IBM Australia has finally opened the floodgates with a variety of PC product announcements. Within the space of a few weeks, a mouth-watering smorgasbord of PC products and services has been presented to a hungry local market.

First of all came the local announcement of the IBM 4700 Personal Computer, only weeks after its US premiere (see PC Hotline). This PC variant links in the widely-used IBM 4700 Finance Communication System (FCS) with the advantages of standalone PCs.

The 4700 PC can interface with magnetic card readers and keypads for entering PINs (personal identification numbers), as well as passbook printers, encryption/decryption units and other devices in the 4700 FCS family. Options were also announced to add these features to existing PCs and PC XTs, although, like the 3270-PC, the range of 4700 PC products is only being marketed through IBM directly, rather than through authorised PC dealers.

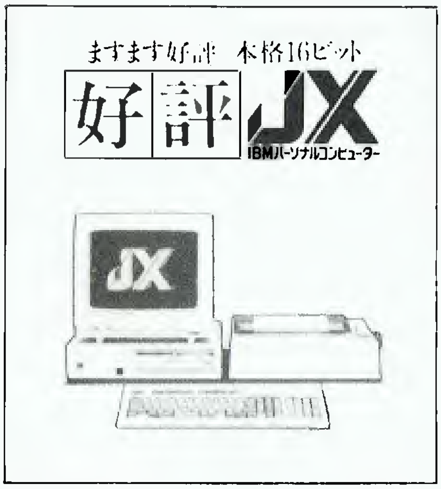
Only a few days later, the Infosearch electronic help database for PC users was announced (also described in PC Hotline), as the mainframe-based system finally came on line at IBM's new corporate headquarters in Cumberland Forest, north-west of Sydney.

The 43XX mainframe nestles in the basement of the new complex, sharing an environmentally-controlled room with some of the most powerful and well-protected computers in the country. (A deep trench surrounds the basement as prevention from possible terrorist attacks, and both indoor and outdoor cameras monitor the area 24 hours a day.)

The Infosearch announcement reflects similar services that have long been available in the US and Europe, and signifies IBM's recognition of the increasing importance of being seen to support PC users, many of whom are at the stage of considering buying additional systems.

Just over a week later came what was perhaps the biggest and best announcement by IBM Australia — the local release of the Enhanced Graphics Adapter, Enhanced Color Display, Professional Graphics Controller, Professional Graphics Display and the PC Graphics Development Toolkit.

These products have been long awaited in Australia, and many observers believed that IBM had possibly been stalling their release until the PC AT was available. The new graphics products adhere to the Graphical Kernel System (GKS), which now stands a good chance of becoming the new standard in high-resolution PC graphics. (GKS is described more fully in the article on page 69).



The PC JX has been heavily promoted in Japan.

The new IBM graphics products were announced as part of a larger package known as the PC Engineering/Scientific series. This series also includes the PC Data Acquisition and Control Adapter (with distribution panel and software support), the PC GPIB Interface Bus Adapter and PC Professional Fortran — a complete ANSI-77 version with extensions. In contrast to the 4700 PC financial products, all of the Engineering/Scientific series are available through authorised IBM PC dealers.

Despite this flurry of announcements, several questions remain — when is the PC II going to be released in Australia, and what about the PC JX? The answer to the first question is still anybody's guess, but the second question is far more intriguing.

The PC JX is an enhanced version of the PCjr, developed by IBM Japan and released late last year. In a surprise move, the Victorian Education Department recently announced that it considered the JX suitable for purchase for schools, despite the fact that the low-end system had not been officially announced in Australia by IBM, and perhaps never will be.

The JX contains 3½in Matsushita disk drives, which represents a potent force in establishing this as the future microfloppy disk standard. Even more interesting is the fact that the JX has not been released in the US, raising the possibility that Australia is being used as a test market by IBM, which has already burnt its fingers once with the ill-fated PCjr.

Whatever the outcome, IBM's recent PC-related announcements are merely the harbinger of a further, more exciting series, including the long-awaited laptop portable and (eventually) the PC II.

— IAN ROBINSON

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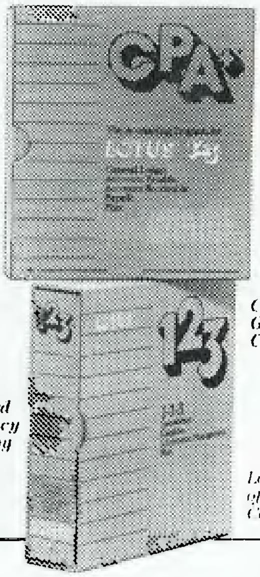

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THE PERSONALITIES BEHIND A USER GROUP

Sporting teams, business ventures and PC users groups have one overwhelming factor in common — in order to survive they must have effective management. Whether this is implemented by a single person or by a committee, the task of managing and organising a PC user group should never be underestimated. Indeed, one could go so far as to say that a user group lives or dies by the effectiveness of its leaders.

First and foremost, a user group requires a strong leader and figurehead, a personality that members feel they can rally around — not unlike the "product champions" described in the book "In Search of Excellence". After all, most of the successful computer systems that user groups endorse were created by this very same type of person.

The PC user group leader, organiser, convenor or president (or whatever title is given) is often one of the motivated team which originally started off the user group, and his (or her) job at meetings is to be the overall controller and mediator, so some sort of public speaking skills are necessary.

As PC users are an enthusiastic, opinionated and interactive lot, a strong presence is often required to keep meetings under control. The best way to organise meetings is to separate them into a formal section (where talks and demonstrations are presented) and then a "random access" session either before or after the formal part of the meeting, where members can mingle and talk among themselves.

The other primary task of the PC user group leader is to work behind the scenes as an important member of the user group committee. The committee plans, co-ordinates and organises meetings and other user group activities, and also informs members about future plans. It is important that the committee has regular meetings separate from the main meetings, which requires an even greater sacrifice of spare time and effort on the part of the committee members. Consequently, committee members are often hard to find, and tracking down suitable personalities should remain a high priority of the group.

A user group committee comprises most of the other key personnel of the user group, including the secretary, treasurer, public relations person and newsletter editor. Many of

The Apcon 85 organising committee originates from the Sydney PC user group

PC USER GROUPS

Sydney PC User Group
Address: GPO Box 5010,
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Contact: Ana Calligeros (02) 290 3655.
Meetings: 5.45pm third Monday,
Price Waterhouse,
11th Floor, 50 Bridge St, Sydney.

MELB-PC
Address: 500 Bourke St,
Melbourne Vic 3000.
Contact: Chris Leptos (03) 605 2222.
Meetings: 5.30pm third Wednesday,
Clunies-Ross House,
191 Royal Pde, Melbourne.

IBM-PC Users' Group (SA)
Address: PO Box 68,
Walkerville SA 5081.
Contact: Don Richards (08) 261 9590.
Meetings: 7.30pm first Thursday,
173 Wakefield St,
Adelaide (or as advised in PC News).

The Illawarra IBM-PC Club
Address: PO Box 77,
Port Kembla NSW 2505.
Contact: Ken Jeffrey (042) 74 0422.
Meetings: 7.30pm first Tuesday,
John Lysaght,
Springhill Street Training Centre.

ACT PC Users Group
Address: PO Box E188,
Queen Victoria Tce, ACT 2600.
Contact: Nick Hammond (062) 86 1102
Meetings: 8pm fourth Monday,
Main lecture room,
Canberra TAFE, Reid.

Perth PC Users Group
Address: 95 William St,
Perth WA 6000.
Contact: Tony Farrell (09) 320 8245.
Meetings: 5.30pm last Monday,
Amherst Room, Bluenote Tavern,
160 Collins St, West Perth.

NEC Users Group
Address: PO Box 568
Milsons Point NSW 2061.
Contact: David Crawford
Meetings: 7.30pm second Tuesday,
Crows Nest Club, Hayberry St,
Crows Nest.

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8-18 Bent St, Sydney.

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Address: PO Box 4720, Spencer St,
Melbourne Vic 3001.
Contact: Robert Taylor (03) 267 4800.
Meetings: 5.30pm first Tuesday,
Light Car Club,
46 Queens Rd. (cnr Roy St), Melbourne.

Adelaide
Address: GPO Box 1969,
Adelaide SA 5001.
Contact: Paul Wragg (08) 223 5711.
Meetings: 7.30pm first Tuesday,
173 Wakefield St, Adelaide.

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Contact: Peter Foreman (09) 322 4899.
Meetings: 5.30pm first Tuesday,
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Multiplan Users Group
Address: PO Box 95,
Forestville NSW 2087.
Contact: Richard Womack (02) 997 1554.
Meetings: 6.15pm second Wednesday,
MTE Centre, 2nd Floor,
cnr York and Market Sts, Sydney.

dBase Users Group
Address: PO Box 297,
Neutral Bay Junction NSW 2089.
Contact: Maria Lengas.
Meetings: 6.30pm first Tuesday,
MTE Centre, 2nd Floor,
cnr York and Market Sts, Sydney.

Turbo Pascal Users Group
Address: 73 Outram St,
West Perth WA 6005.
Contact: Aaron Regan (09) 322 1834.
Meetings: 7.30pm second Tuesday,
2/294 Rokeby Rd, Subiaco WA.

these may be one and the same person, and other possible positions are public domain software librarian and bulletin board sysop (system operator).

While the secretary, treasurer and newsletter editor do basically the same tasks as those same positions in any club or organisation, the software librarian and sysop positions are unique to computer user groups.

A major attraction of PC user groups is the library (collection) of public domain software — that is, programs that have been written by individuals and donated for anyone to use free of charge. There are several hundred disks stuffed full of games, applications and utilities circulating around local user groups, and many thousands more are available through overseas PC user groups.

Therefore the job of public domain librarian can become quite demanding — so much so that many user groups require a separate committee just for this task alone. The job involves ordering and copying disks, informing members of the latest offerings and updating the ever-expanding catalogue.

If a user group is fortunate enough to have a dedicated PC as the official group bulletin board system, then the sysop is another person who has his work cut out for him. Sysops are a special breed, and for that reason may also be difficult to track down, but the search is well worth the end result.

The sysops's job is to monitor and maintain the bulletin board system, which probably functions 24 hours a day. This involves uploading and downloading public domain software (obviously not all of it can fit on the system at once), keeping track of user registrations, answering users' queries, purging old (or obscene) messages and generally maintaining the complete system. Definitely a techie's job.

Providing all of these mythical people can be found, and provided these volunteers receive continual support from group members, then a PC user group can look forward to a long and prosperous time ahead of it.

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Unintentional Redirection

While developing an AUTOEXEC.BAT file for an application, Dos 2.00 gave me an unexpected error message. It appears to me to be an undocumented idiosyncracy in Dos 2.00. I have a series of ECHO [message] statements in the batch file, and in the middle of the series, one ECHO message was not displayed. In its place, Dos displayed the error message 'File not found'. I discovered that the symbols <and>, which I had used as brackets, were being interpreted as a request for redirection of standard input/output.

The < and > symbols are interpreted as a request for redirection in both the ECHO and the REM commands. However, when a line at the Dos prompt begins with a period or double quote, the line is displayed as a remark with no processing of the line. The only warning I could find in the Dos 2.00 manual was the note stating that :, \, <, and > could no longer be usd in file names. Redirection within an ECHO command may be useful in a program's more creative moments, but it may cause disaster for the unwary.

Dale Farland

FORMAT Bell

I have a habit of formatting all disks immediately after opening a new box. This takes some time, and meanwhile you can do something else. But because the FORMAT program prompts are visual, you have to keep checking the screen. I patched FORMAT.COM so it beeps when it prompts for a volume label and also when it prompts to quit or to format another disk. The patch involves nothing more than putting the BEL character (Ascii value 07) in the prompting text.

For the Dos 2.00 FORMAT.COM (stamped 3-08-83, 12:00 p), type in the following, making sure to include the spaces:

DEBUG FORMAT.COM<Enter>
E CBE<Enter>
59 2F 4E 20 07<Enter>
E E67<Enter>
07<Enter>
W<Enter>
Q<Enter>

What you see on the screen should duplicate what is shown in "Display of putting a bell in FORMAT.COM," except that the segment prefix '0905:' will vary, depending on the amount of installed memory.

From now on the FORMAT program will beep when it prompts you for a volume label and when it asks if you want another disk formatted.

Pieter Huizinga

```
A>DEBUG FORMAT.COM
-E CBE
0905:0CBE 28.59 59.2F
0905:0CC0 2F.4E 4E.20 29.07
-E E67
0905:0E67 20.07
-W
Writing 1780 bytes
-Q
A>
```

Display of putting a bell in FORMAT.COM

```
20 DEF FNCAP$(ANS$)=CHR$(ASC(ANS$+" ") OR 32)
200 INPUT "Do you want instructions";A$
210 IF FNCAP$(A$) = "y" THEN GOSUB 5000
500 INPUT "Which option do you want";RESP$
510 RESP$=FNCAP$(RESP$)
```

FNCAP.BAS filters the first response character to lowercase.

Drop That Cap

I use the function shown in line 20 of FNCAP.BAS to convert the first character of a user response to its lowercase equivalent. The function returns a space character if ANS$ is null. This command can be used in many ways, including those shown in lines 200, 210, 500, and 510. I prefer to convert to lowercase because this filters numbers and most special characters without changing them.

Jeff Johnson

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```
XLATE.BAS:  A translation function in BASIC

10 DEF FNXLATE$(S$,T$,A$,S,T)=MID$(T$,((-((T=1)*(-((S=1)*
INSTR(S$,A$))-((S<>1)*(INSTR(S$,A$)\S+1))))-((T<>1)*
(((-((S=1)*INSTR(S$,A$))-((S<>1)*(INSTR(S$,A$)\S+1)))-1)*
T+1)))*-(INSTR(S$,A$)>0))-(INSTR(S$,A$)=0)*255,T)
20 ' Line 30 demonstrates lowercase to uppercase translation
30 UPPER.CHAR$=FNXLATE$("abcdefghijklmnopqrstuvwxyz",
"ABCDEFGHIJKLMNOPQRSTUVWXYZ",LOWER.CHAR$,1,1)
40 ' Line 50 demonstrates single to multiple character conversion
50 N$=FNXLATE$("123456789","ONE  TWO  THREEFOUR FIVE
 SIX  SEVENEIGHTNINE ",N$,1,5)
60 ' Line 70 demonstrates converting decimals to fractions
70 FRACTION$=FNXLATE$(".125 .250 .375 .500 .625 .750 .875",
"1/81/43/81/25/83/47/8",DECIMAL.ENTERED$,5,3)
80 ' Lines 90-110 demonstrate translating month numbers to month names
90 MONTH.NOS$="01 02 03 04 05 06 07 08 09 10 11 12"
100 MONTH.WORDS$="January  February March    April    May
      June     July     August  SeptemberOctober  November December "
110 MONTH.NAME$=FNXLATE$(MONTH.NOS$,MONTH.WORDS$,LEFT$(DATE$,2),3,9)
120 '
200 ' The syntax and rules for using the function are as follows:
210 '
220 '   RESULT$=FNXLATE$(SOURCE$,TARGET$,ARGUMENT$,SOURCELEN,TARGETLEN)
230 ' Where:
240 '           SOURCE$ is the list of entries to be scanned.
250 '           TARGET$ is the list of values to be returned.
260 '           ARGUMENT$ is the value to match.
270 '           SOURCELEN is the length of each entry in SOURCE$
280 '                   ( 0 < SOURCELEN < 255 )
290 '           TARGETLEN is the length of each entry in TARGET$
300 '                   ( 0 < TARGETLEN < 255 )
310 '
320 ' A null value is returned if no match is found for ARGUMENT$
999 END
```

Listing 1: The **XLATE.BAS** program contains a handy translate function.

Parlez-Vous Anything?

In the course of developing software for the PC, I have encountered several situations that called for a translate function.

Such a function is an intrinsic part of most high-level languages, but it is absent from Basic. After some thought I devised the function shown in line 10 of XLATE.BAS.

The function looks very complicated — almost impossible to interpret — but if you study it closely you will see that it performs a lookup-and-translate operation.

The FNXLATE$ function can be used for a wide variety of translation tasks, such as changing lowercase to uppercase, single characters to multiple characters, decimals to fractions, and month numbers to month names.

When the source list entries are longer than one character, you may need to place a character between each of them to prevent false matches. In lines 70 and 90 a space is used for that purpose.

Remember to enter the function as one unbroken line. For each line, press <Enter> only after typing the final character, that is, only prior to typing lines that begin with 20, 30, 40, and so on.

Walt Muncaster

Turbo Trick

When a program written in Turbo Pascal ends, Dos must reload the COMMAND.COM file into memory.

If Dos cannot find the file, it displays the message "Insert COMMAND.COM disk in drive A: and strike any key when ready".

This can be annoying to experienced users and baffling to novices.

Fortunately, there is a simple way to prevent the problem. Before you compile the Turbo Pascal program, select item A from the Options menu to change the maximum amount of dynamic memory.

Change the default value of 4000 (hex), which is 256K to 400 (hex), which is 16K.

Unless your program deals with huge dynamic variables or array parameters, it will run properly, and Dos would not need to reload COMMAND.COM.

Michael Covington

The Wild Type

The TYPE command in Dos, versions 2.00 and later, does not allow question marks and asterisks to indicate a group of files. To make those wild-card characters usable, I have created a batch file called TY.Bat that consists of the following line: **COPY%CON:** I chose the name TY because it's the command used on many mainframes to display files.

Edward Fischer

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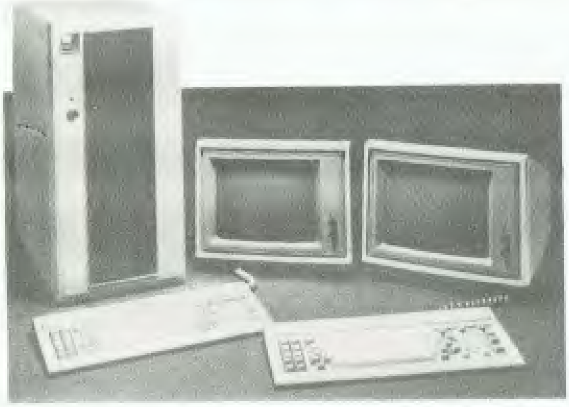

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BAD COMMAND OR FILE NAME

The IBM is home, installed,
I face the empty screen, appalled,
Will I ever make this WordStar shine,
this software that I'm told's benign?
I touch a key, the disk drives spin;
I allow myself a high-tech grin
until I see the screen proclaim:
"Bad command or file name".

I persevere a month or more
as bit by byte I learn the lore:
A comma wrong, a space left out
leaves the dumb machine in doubt;
computers need precise commands
as "if then else": such like demands,
The litany is otherwise the same:
"Bad command or file name".

Later still I realise
the IBM is really wise:
how often in some loud debate
I've failed to communicate
an order, wish, feeling, stance;
left understanding quite to chance?
Most people would react the same
to a "Bad command or file name".

Timoshenko Aslanides

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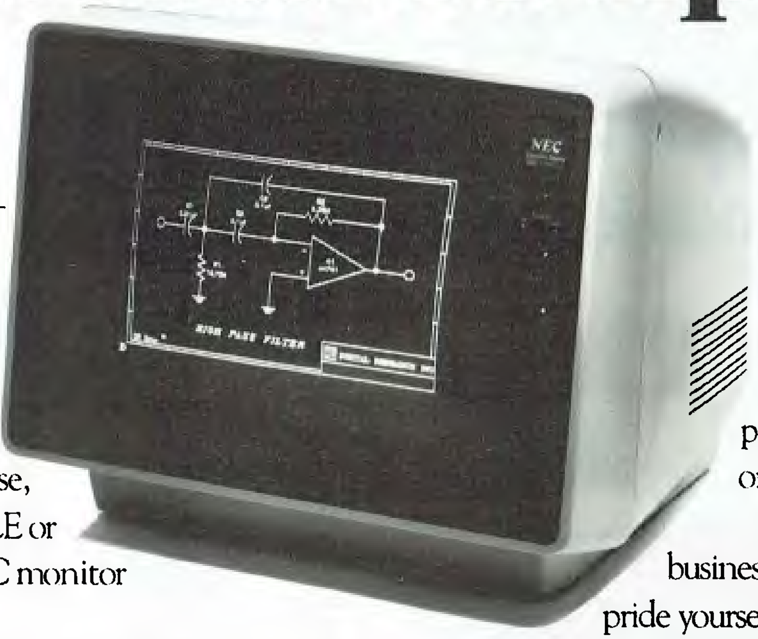

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NEC Corporation,
Tokyo, Japan

PC JULY '85

The Power of Japan.

PERIPHERALS

Novell networks

TELECOMPUTING PCS Pty Ltd has released the Novell NetWare operating system, claimed to offer substantial performance improvements due to its genesis on minicomputers. Ported to the IBM PC environment, NetWare supports PCnet from Orchid Technology, Omninet from Corvus Systems, Etherlink from 3Com, Multilink from Davong, Plan 200 from Nestar, Arcnet from Standard Microsystems, G-Net from Gateway, Pronet from Proteon as well as Novell's own Netware/S. It offers password, user and directory security, default file locking, manual file locking, transaction sharing and individual record locking. NetWare needs PC-Dos 1.1 or 2.0, 512K-bytes of Ram in the server PC and 1M-byte of hard disk storage.

Further information:
Telecomputing PCS Pty Ltd,
2nd Floor, 156 Pacific Highway,
St Leonards NSW 2065.
Tel: (02) 439 5966.

Full House

TELECOMPUTING PCS Pty Ltd has released the Canadian-made series of Comway IBM PC AT addon cards. The ComGraphics card offers high resolution color and monochrome graphics capabilities for use with 1-2-3 or Framework. The Piggy Plus option card adds up to 448K-bytes of Ram, permitting sophisticated windowing software to run. It also includes game port, battery-powered clock/calendar and comes with the usual utilities. The ComTronics card adds parallel printer port, light pen interface and optional serial port.

Further information:
Telecomputing PCS Pty Ltd,
2nd Floor, 156 Pacific Highway,
St Leonards NSW 2065.
Tel: (02) 439 5966.

One of the new range of Tallgrass cartridge tape backup systems.

Tall storage

TALLGRASS Technologies Australia has launched a new family of mass storage units for the PC, including 25-, 35- and 80M-byte subsystems, all with 60M-byte cartridge tape backup. In addition, the 60M-byte tape backup system has been upgraded. All four systems use a new format called PC/T (Personal Computer Tape) for recording data, said to provide users with many of the easy features of floppy disk backup. Prices are: $5695 for the 25M unit, $7250 for 35M, $11,490 for 80M and $3250 for the 60M-byte tape only unit.

Further information:
Tallgrass Technologies Australia,
Suite 1, 34 East St,
Five Dock NSW 2046.
Tel: (02) 712 2010.

On the dot

EPSON Australia has added a $410 dot matrix printer to its range which is claimed to produce near-letter quality from its nine-pin head at 100 char/sec. The LX-80 uses back panel dip switches for setting line spacing and tabs as well as for changing typefaces. More than 50 control codes access word processing features. Centronics interface and friction feed are standard, RS232 and IEEE-488 and tractor optional. Epson says the printer has an improved data dump mode permitting programmers to print out hex dumps and their Ascii representations.

Further information:
Epson Australia Pty Ltd,
Unit 3, 17 Rodborough Rd,
Frenchs Forest NSW 2086.
Tel: (02) 452 5222.

PERIPHERALS

The Deskmate monitor stand supports most displays.

Monitor mover

COMPUTER Products Network (CPN) has released the locally designed and manufactured Deskmate monitor mover, a movable display support arm that clamps to a desk and allows users to adjust the monitor's position to their liking. Adjustments are 180mm vertical range, 360° swivel range and 15° tilt range. The Deskmate supports displays weighing up to 30kg and uses moulded plastic elements designed to blend in with modern office computer hardware. It incorporates a cable duct to avoid that "tangled web" effect often associated with desktop computers. Retail price is about $200.

Further information:
Computer Products Network,
99 York St,
Sydney, NSW 2000.
Tel: (02) 290 3100.

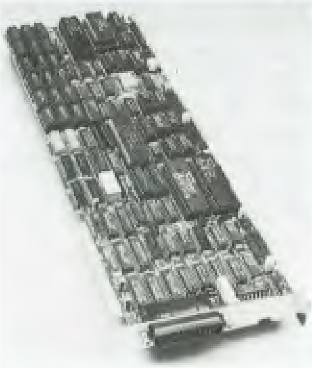
Keys to Irma

SOURCEWARE has announced the Irmakey/3270 keyboard for the IBM PC or compatibles, which gives these machines all the keys found on the IBM 3270 remote terminal as well as all keys found on the PC. The keyboard, from Digital Communications Associates (DCA), also contains four keys that give access to Irma functions such as 3278 terminal emulation and DCA utilities such as file transfer. Irma lets the PC function as an IBM 3278 terminal while retaining full PC functionality. Driver software and a keyboard reconfiguration utility are supplied.

Further information:
Sourceware,
4/73 Albert Ave,
Chatswood, NSW 2067.
Tel: (02) 411 5711.

Emulex persysts

EMULEX Corporation has introduced a number of Persyst addon products for the IBM PC, including a distributed communications processor and color and mono combo cards with printer ports and memory expansion, as well as a mega-memory card for the AT. The DCP-88/VM distributed communications processor includes an 8088 and up to 512K-bytes of Ram to support up to four multi-protocol communications lines. Memory is bank-addressable from the PC or the frontend processor. The color and mono combo cards use custom gate array technology for display control and the bidirectional parallel printer port. A serial port is also provided. The combo boards offer up to 384K-bytes of Ram and a clock/calendar option. Software includes memory drive emulation and print spooling. The Mega Memory board for the AT, which allows for up to 3M-bytes or Ram, also comes with these utilities.



Further information:
Emulex Corporation,
Suite 106, 160 Rowe St,
Eastwood NSW 2122.
Tel: (02) 858 4833.

Cheaper speed

SENDATA has launched a low-cost 1200 bits/sec full duplex (V.22) modem as the latest addition to its range of modems and acoustic couplers. The direct-connect unit offers manual as well as automatic answer and disconnect and accommodates both asynchronous and synchronous data transmission. The modem is available with handset. Both versions are Telecom-approved. Designed and made entirely by the company's Melbourne plant, the Sendata 1200 is compatible with 1200 bits/sec modems from other makers. Enhancements such as autodial and 300 bits/sec alternative speed selection are said to be on the way.

Further information:
Sendata Pty Ltd,
69 Sutherland Rd,
Armadale, Vic 3143.
Tel: (03) 509 5844.

PERIPHERALS

The Alloy PC-Tape backup unit plugs into the PC.

Tape tip

ALLOY Computer Products offers a low-cost 25M-byte cartridge tape backup system for the IBM PC XT and Sperry systems said to permit complete disk backup in less than 10 minutes at 1.1M-bytes/sec. All files remain accessible by file, group or as the entire disk contents including sub-directories, appearing with time and date stamping. The PC-Tape (MT25) plugs into the back of the PC and requires neither power nor expansion slots. The unit includes MicroTip software using commands compatible with the existing PC-Dos commands Format, Backup and Restore, as well as a number of utilities. Recommended retail price is $1995 plus tax.

Further information:

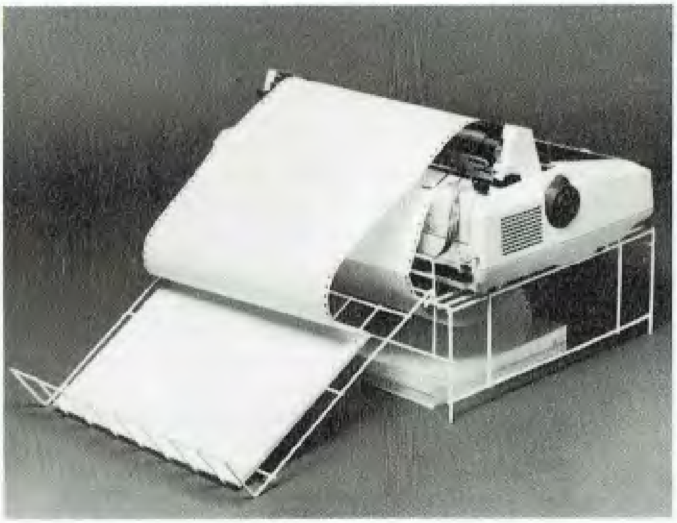
Alloy Computer Products,
Pran Central, 325 Chapel St,
Prahran Vic 3181.
Tel: (03) 529 8455.

Streaming floppy

ELMEASCO Instruments Pty Ltd has launched the Cipher Data Products Model 5210 Floppy Tape backup system, a 25M-byte ¼in tape unit designed to work directly off the external IBM PC floppy interface connector. The file-oriented system is said to respond to disk-like commands — including three new backup, restore and format function calls — and to operate at around 1M-byte per minute transfer speeds with single-error correction. Data protection features prevent users from writing over existing data. Two 10M-byte hard disks can be backed up on one standard cartridge.

Further information:

Elmeasco Instruments Pty Ltd,
15 McDonald St,
Mortlake NSW 2137.
Tel: (02) 736 2888.



The Lintek Paper Tamer keeps desktops tidy.

Printer tamed

LINTEK Computer Accessories has released version 2 of its Paper Tamer, designed for 136-column printers using 380mm (15in) paper. The PT2 stores up to 900 sheets of continuous stationery under the printer and collects printout in a catcher tray. The wider version costs $60, compared to $50 for the 80-column version.

Further information:

Lintek Computer Accessories,
Suite 23, 243 Ernest St,
North Sydney NSW 2060.
Tel: (02) 929 3127.

Sneak Preview

SOURCEWARE has released AST Research's Preview graphics card for the IBM PC XT or AT, which lets users mix bit-mapped graphics and high-resolution text on monochrome displays. The addon board yields the maximum possible resolution on standard IBM monitors by bit-addressing the total 720 horizontal pixels by 348 vertical lines display memory.

Preview is said to be functionally equivalent to the IBM Model 4900 monochrome display and printer adapter and to support programs written for the Hercules card. It makes full use of the graphics capabilities of software such as Lotus 1-2-3, Symphony and Framework, while being well suited to bit-mapped text processing packages such as Word and windowing software such as Windows. The card comes with a utility diskette offering RAM drive and print spooling. The card is said to work with any expansion memory.

Further information:

Sourceware Pty Ltd,
4/73 Albert Ave,
Chatswood, NSW 2067.
Tel: (02) 411 5711.

PERIPHERALS

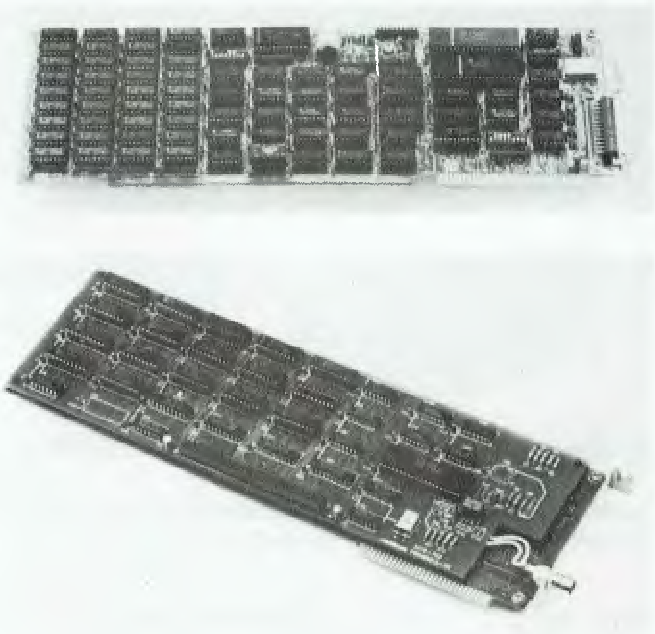
New Brothers

BROTHER has launched two new electronic printers: the HR-15XL daisy wheel printer and 2024L fast dot matrix printer. The HR-15XL incorporates a 3K-byte buffer and can print bidirectionally. A text reprint function allows the user to print out as often as required whatever is stored in the buffer. Shadow printing function and red color printout are available, as are proportional spacing, sub and superscript and auto-underlining. Interface is either Centronics parallel or RS-232 serial. Options include a cut sheet feeder and the Brother KB-50 keyboard unit. The HR-15XL costs around $800 including sales tax. The 2024L dot matrix printer costs around $1800 including sales tax, making it the most expensive printer in Brother's dot matrix range. It has a printing speed of 160 char/sec in draft mode, 96 char/sec in elite, and 80 char/sec in pica. Optional auto cut sheet feeders also allow the 2024L to handle A4 and B4 paper sizes.

Further information:
Brother Industries,
7 Khartoum Rd,
Nth Ryde NSW 2113.
Tel: (02) 887 4344.

Brother's new daisywheel printer HR-15XL

Brother's new dot matrix printer 2024L.

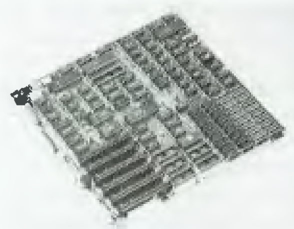


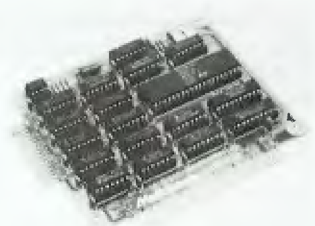
The new Multitech MFB-PC and 3278-PC boards.

Multitech releases

MULTITECH Industrial Corp has launched an IBM PC-compatible motherboard, the CPU-PC, with an 8088 CPU and 128K-bytes of Ram, DMA disk controller and serial and parallel ports as well as five PC-compatible expansion slots. In addition, the Taiwan manufacturer has released the FDI-PC drive adapter for up to two internal 5.25in drives, the MFB-PC multifunction board for up to 384K-bytes extra Ram, another parallel printer port, an asynchronous communications controller and a real-time battery-backed clock. This board comes with Ram disk, clock and print spooler software. The third new Multitech board is the 3278-PC interface card allowing the PC to emulate IBM's 3278-2A or 3279-2A remote terminals for coax connection to the IBM 3274 cluster controller. The board comes with emulation software.

Further information:
Multitech Industrial Corp,
9th Floor, 266 Sung Chiang Rd,
Taipei 104, Taiwan.
Tel: (035) 775 102.





Window on business

SYBIZ has launched the Sybiz Plus series of accounting modules with enhancements said to include a windowing facility. The vendor says users can search for and look at any account in the database through the "View" facility at any time, to and from any ledger, without interrupting work in progress. The window also offers a four-function calculator facility, whose results can be transferred into the current work. A new maintenance program reportedly makes it easy to open, edit and close accounts. More extensive reporting functions are offered in all modules, and professional invoicing is available as an option. The new series costs $795 for the main module, and $345 each for the ancillary modules. The current Sybiz series will remain on sale at $100 less per main unit.

Further information:
Sybiz Software,
168 South Terrace,
Adelaide SA 5000.

Transport utility

AWARD software offers a disk conversion utility called Crossdata claimed to transfer text and data files such as spreadsheets from any CP/M to any Dos format. The utility runs on the IBM PC and compatibles, features on-screen menus, split screen file directory presentation with windows for two drives and extensive options for advanced users.

Further information:
Award Software,
90 King St,
Perth WA 6000.
Tel: (09) 322 6654.

Qwiknet for safety

PSDI Australia Pty Ltd offers the Qwiknet project management software said to handle up to 250 activities on an IBM PC. The package includes a three-button optical mouse for ease of operation in planning time, money and resources necessary for completing a project and analysing "what if" scenarios. Reports can be generated in 20 different formats and logic diagrams printed that show an entire project's activities and their interdependencies. Graphics are used to display resource utilisation and cash flow, enabling users to perform cash flow analysis. The package requires 384K-bytes of Ram and twin drives. It runs under MS-DOS 2.0.

Further information:
PSDI Australia Pty Ltd,
4th Floor, 76 Berry St,
North Sydney NSW 2060.
Tel: (02) 923 1344.

Kermit for PC

GEEBAN Pty Ltd has introduced file transfer enhancements to its Honeywell VIP7200 emulator that allow file transfers between an IBM PC and Honeywell DPS6/Level 6 minis under the "Kermit" protocol at speeds of up to 9600 bits/sec via RS232, RS422 and current loop interfaces. The product is said to allow software developers to write programs using screen editors on the PC and upload them to the Honeywell host for compilation. The software, including file conversion utilities, comes on an IBM PC-compatible disk.

Further information:
Geeban Pty Ltd,
Suite 2, 637 Darling St,
Rozelle NSW 2039.
Tel: (02) 818 1822.

PC packets

TELECOMPUTING PCS distributes Top 25, a software package said to give IBM PC users direct access to public and private X.25 protocol packet-switching networks. Top 25 requires an SDLC interface board. It supports all three levels of the CCITT recommendation, handling both virtual calls and permanent virtual circuits. Up to eight logical channels may be active simultaneously. The software is available in three basic variants: one generic version for plain X.25 transmission to and from standard PC-Dos floppies and keyboard control over all relevant functions; another version with integrated vendor-supplied IBM 3278 or DEC VT100 terminal emulation, and a third, user-callable version with what is said to be an easy X.25 packet level interface and suitable for integration with the user's own application software.

Further information:
Telecomputing PCS Pty Ltd,
2nd Floor, 156 Pacific Hwy,
St Leonards NSW 2065.
Tel: (02) 439 5966.

Solution 6 goes compatible

ACCOUNTING software house Solution 6 has "ported" its packages from Wang machines to run on the IBM PC XT, Portable and compatibles. The company will continue to support Wang, but said it made the move because many accounting practices had already invested in PCs and XTs and were still looking for effective software.

Further information:
Solution 6 Pty Ltd,
Suite 22, 198 Moggill Rd,
Taringa, Qld 4068.
Tel: (07) 371 8900.

MS macro assembler

MICROSOFT has released a new version of its macro assembler, said to work with the entire 16-bit family of Intel processors. It also reportedly supports the Intel math co-processor chips. Development utilities include a symbolic debugger that allows programmers to examine and step through their source code. Other tools include an object linker, library manager, cross-reference utility and a program maintenance utility.

Further information:
Microsoft Pty Ltd,
PO Box 95,
Forestville NSW 2087.
Tel: (02) 452 5088.

Inte-resting

ARCOM Pacific has announced the InteSoft series of office automation software from Schuhart Software Systems for the IBM PC XT and compatibles. The first five modules released are InteMate, a menu generator, applications manager and calculator/scratchpad facility; InteCalc, a three-dimensional spreadsheet with graphics and windows; the IntePlan time management system with calendar, time and expenses monitoring; the IntePert project management module and the InteWord word processing software. Data can be transferred between the five programs, which use a consistent operator interface.

Further information:
Arcom Pacific,
252 Abbotsford Rd,
Mayne Qld 4006.
Tel: (07) 52 9522.

SOFTWARE

Sales a Breeze

BREEZE Software has developed multiterminal software claimed to link up to 15 point-of-sale (POS) terminals through a shared database. A separate terminal permits manager enquiries and processes management reports. The software is said to permit the store owner or manager to check on all current accounts, sales, stock and even cash in the tills from his own desk even while the common database is being updated. The Geelong software house chose the PC-Net Lan to run its multiterminal POS software, which can be tailored to individual retailer requirements or even differing requirements within the one network. Magnetic card readers, bar code readers and cash drawer operation can be accommodated.

Further information:
Breeze Software (Aust)
Pty Ltd,
1st Floor, 39 Gheringhap St,
Geelong Vic 3220.
Tel: (052) 21 6144.

Easy reckoning

INTEGRITY has launched a one-floppy accounting package aimed at the small business user. Running on all popular systems with a minimum of 256K-bytes of Ram and twin disk drives, Accounting One reportedly handles up to 10,000 customer listings, 10,000 stock items, 10,000 suppliers and 2000 accounts. Routines for entering details of sales, receipts, purchases, payments and refunds are said to be easy, with automatic updating of all relevant items. The package retails for $695.

Further information:
Integrity Business Software
(Australia) Pty Ltd,
582 St Kilda Rd,
Melbourne Vic 3004.
Tel: (03) 529 4500.

Graphic Cogs

R.J. NAIRN & Partners have released the Cogs color graphics system for the IBM PC, a graphics routine library for Fortran and Pascal programmers featuring elements of the Core and GKS graphics standards. It is said to support the IBM color graphics adapter in medium-resolution four color mode, the Tecmar Graphics Master card in high-resolution 16 color mode and a variety of plotters. Support for IBM's enhanced display adapter card has been announced. The company is also developing PC-GKS, said to be a closer implementation of the GKS standard.

Further information:
R.J. Nairn & Partners Pty Ltd,
214 Northbourne Ave,
Braddon NSW 2601.
Tel: (062) 49 7644.

UK model

INTELLIGENCE now offers Mastermodeller, a British planning and reporting package for PC-DOS and MS-DOS machines said to combine powerful facilities for modelling, reporting and consolidation. All relevant commands can be included in automated job files. Translation aids are said to ease the transition for existing 1-2-3, Micromodeller or Micro FCS models and links to dBase II, Dataflex and other database packages as well as external graphics packages are included. The vendor claims true hierarchical consolidation, with visual display of all relationships and automatic code generation and faster performance than spreadsheets such as Lotus 1-2-3.

Further information:
Intelligence (Aust) Pty Ltd,
60-64 Shepherd St,
Chippendale NSW 2088.
Tel: (02) 699 3877.

SYSTEMS

The Datavue 25 portable is PC-compatible.

Big-memory portable

COMMUNICATIONS & Peripherals Australia has announced a 6.5kg portable with 80 x 25 LCD screen and 640K-bytes standard Ram. The Datavue 25 supports graphics applications with full 640 x 200 dots resolution and can operate from either mains or VCR-type battery pack. It is said to run most IBM PC software. Retail price is "under $4000", said the company, a new sales and support organisation operating in five States and formed by former franchises of Anderson Digital Equipment.

Further information:
Communications &
Peripherals Australia,
14 Whiteside Rd,
Clayton Vic 3168.
Tel: (03) 544 3444.

Grid on the go

VICOM Australia Pty Ltd has introduced the GridCase line of IBM-PC compatible portables, offering a choice of 80 x 25 LCD and plasma displays, memory options and battery configurations. All machines weigh under 6kg, are encased in magnesium and have a 3½in floppy disk drive with 720K-bytes storage. I/O interfaces permit connection to a PC expansion unit, external keyboard and 5¼in external floppy and 10M-bytes Winchester drives. The GridCases also take up to 512K-bytes of user-installable Rom packs. Communications support includes the GridServer local area and remote area networking system, enhanced to support IBM 3780 communications with host computers. Master/Slave software permits users to physically link up their unit with a PC, XT or AT for direct file exchanges. Two LCD flat panel displays are used for users requiring prolonged battery operation. The plasma display is said to be particularly suited for group presentations. Resolution on all three bit-mapped displays is IBM-standard 640 x 200.

Further information:
Vicom Australia Pty Ltd,
PO Box 366,
South Melbourne Vic 3205.
Tel: (03) 62 6931.

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- Graphics
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- Spreadsheets
- Vertical Market Packages

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BLUEBOOK 2 — HARDWARE GUIDE	30th July	30th July	6th August

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PC SOFTWARE DIRECTORY

The IBM Personal Computer and compatible systems currently enjoy the world's largest collection of available software, ranging from spreadsheets to spelling checkers, and from CAD/CAM systems to communications. As a ready reference and comparison guide, Australian PC World presents the latest and greatest version of the PC Software Directory.

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SPREADSHEETS
UTILITIES
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COMMUNICATIONS
ACCOUNTING
TUTORIALS
GRAPHICS
GAMES
INTEGRATED APPLICATIONS

PC SOFTWARE DIRECTORY

OPERATING SYSTEMS

Name	Manufacturer	Distributor	RRP	Min. req.	Comment
UCSD p-System	IBM	IBM (Aust)	$625	64K 2DD	+Pascal
UCSD p-System	IBM	IBM (Aust)	$625	64K 2DD	+Fortran
Concurrent CP/M-86	Digital Research	Arcom Pacific	$350	192K 1DD	PC World August 84
Concurrent PC-DOS	Digital Research	Arcom Pacific	$495	64K 1DD	PC World Mar/Apr 85
PC-DOS 2.0	IBM	IBM (Aust)	$115	64K 1DD	PC World August 84
Pick	Pick Systems	Triad Software	$1175	256K, hard d.	PC World Nov 84

LANGUAGES

Name	Manufacturer	Distributor	RRP	Min. req.	Comment
Basic Compiler	Microsoft	Microsoft	$635	64K 1DD	PC World Nov 84
Business Basic Comp.	Microsoft	Microsoft	$770	64K 1DD	
C Compiler	Microsoft	Microsoft	$770	128K 1DD	
C Compiler	Digital Research	Arcom Pacific	$466		PC World August 84
Fortran Compiler	Digital Research	Arcom Pacific	$620	96K	
CBasic Compiler	Digital Research	Arcom Pacific	$721	64K	
Cobol Compiler	Microsoft	Microsoft	$1065	128K 2DD	
Fortran Compiler	Microsoft	Microsoft	$550	160K 2DD	
Pascal Compiler	Microsoft	Microsoft	$525	160K 2DD	
Pascal MT+	Digital Research	Arcom Pacific	$788	64K 2DD	
Basic Interpreter	Microsoft	Microsoft	$550	64K 1DD	
APL/PLUS PC	STSC Inc.	Sourceware	$1199		
Basic Compiler	IBM	IBM (Aust)	$524	64K 1DD	PC World Nov 84
Cobol Compiler	IBM	IBM (Aust)	$1155	64K 2DD	
Fortran Compiler	IBM	IBM (Aust)	$616	128K 2DD	Fortran 77 standard
UCSD Fortran Compiler	IBM	IBM (Aust)	$1077	64K 2DD	
Pascal Compiler	IBM	IBM (Aust)	$515	128K 2DD	PC World April 84
UCSD Pascal Compiler	IBM	IBM (Aust)	$1077	64K 2DD	
Lattice C	Lattice Corp	Fagan	$770	128K	
Assembler & Tools	Digital Research	Cullinet Software	$260	64K 128K	
Personal Basic	Digital Research	Arcom Pacific	$206	76K 1DD	
Dr Logo	Digital Research	Arcom Pacific	$214	192K	
Access Manager	Digital Research	Arcom Pacific	$499	12K 1DD	
Display Manager	Digital Research	Arcom Pacific	$614	96K 1DD	
PL1	Digital Research	Arcom Pacific	$915	128K 1DD	
Macro Assembler	Microsoft	Microsoft	$305	64K 1DD	supports 80286
DBL	DISC	Brennan Bates	$700	128K 1DD	
Run C	Age of Reason	Fagan	$309	256K 1DD	C Interpreter

WORD PROCESSING

Name	Manufacturer	Distributor	RRP	Min. req.	Comment
EasyWriter II	Sorcim	Sourceware	$599	96K 1DD	PC World May 84
EasyWriter II	Sorcim	Sourceware	$729	96K 1DD	+E.speller/E.mail
Wordperfect	Satellite Software	Sourceware	$595	128K 2DD	PC World Aug 84
Personal Wordperfect	Satellite Software	Sourceware	$269	96K 2DD	
WordStar Prof.	MicroPro	Imagineering	$595	256K 1DD	Mailmerge/CorrectStar
Superwriter	Sorcim	Arcom Pacific	$332	—	
VisiWord	Visicorp	Imagineering	$395	64K	
PFS: Write	Software Publishing Co	Imagineering	$175	64K	
Spellbinder	Lexisoft	Software Source	$495	128K 2DD	
MultiMate	MultiMate International	SCA	$595	128K 2DD	
T/Maker III	Lifeboat Associates	Fagan	$351	128K 2DD	
Vedit	US	Fagan	$220	128K 2DD	
Microsoft Word	Microsoft	Microsoft	$550	256K 2DD	includes Spell
DisplayWrite 1	IBM	IBM (Aust)	$161	128K 1DD	
DisplayWrite 2	IBM	IBM (Aust)	$496	192K 2DD	
PC Writer	IBM	IBM (Aust)	$335	128K 1DD	
Writing Assistant Officewriter	IBM	IBM (Aust)	$229	129K 2DD	
Wordstar 2000	Micropro	Imagineering	$645	256K 2DD	
Wordstar 2000+	Micropro	Imagineering	$795	256K 2DD	
Wordstar	Micropro	Imagineering	$445	64K 1DD	
Bank St. Writer	Broderbund	Imagineering	$115	64K 1DD	

PROJECT MANAGERS

Name	Manufacturer	Distributor	RRP	Min. req.	Comment
Milestone	Digital Research	Arcom Pacific	$349	256K	
Harvard Project Manager	Harvard Software	Sourceware	$599	128K 1DD	
SuperProject	Sorcim	Arcom Pacific	$595	256K 2DD	
Timeline	Breakthrough	Imagineering	$565	$256K 2DD	

PC SOFTWARE DIRECTORY

SPREADSHEETS

Name	Manufacturer	Distributor	RRP	Min. req.	Comment
Multiplan	Microsoft	Microsoft, IBM	$325	128K 1DD	
SuperCalc	Sorcim	Arcom Pacific	$288	48K 1DD	
SuperCalc 2	Sorcim	Arcom Pacific	$324	64K 1DD	
SuperCalc 3	Sorcim	Arcom Pacific	$422		
VisiCalc	VisiCorp	Imagineering	$428	192K 2DD	
MicroPlan	Chang Laboratories	Software Suppliers		64K 1DD	
PerfectCalc	Perfect Software	Software Suppliers		128 2DD	

UTILITIES

Name	Manufacturer	Distributor	RRP	Min. req.	Comment
ProKey	RoseSoft Inc.	Sourceware	$299	64K 1DD	Keyboard Programs
SmartKey II	SmartKey	FBN Software	$69	64K 1DD	Keyboard macros
Sidekick	Borland	PC Extras	$89	64K 1DD	Calculator/notepad
Super Spellguard	Sorcim	Multisoft	$218	128K	W.P. Spelling Checker
Hard Runner	Nostradamus	PC Extras	$75	hard disk	
Displaywrite Legal support	IBM	IBM (Aust)	$272	192K 2DD	Legal spelling checker
DOS Shell XT	Handcrafted	Aardvark Utilities	$95	128K 1DD	File organizer utility
Keyswap 3.02	Dicker Data	Aardvark Utilities	$180	128K 1DD	Macros with windows
Copy Write	Quaid	Aardvark Utilities	$95	128K 1DD	Backup program
Disk Explorer	Quaid	Aardvark Utilities	$100	128K 1DD	
Zero Disk	Quaid	Aardvark Utilities	$100	128K 1DD	
Syste Mate	Syste Mate	Aardvark Utilities	$95	128K 1DD	
Filing Assistant	IBM	IBM (Aust)	$230	128K 1DD	
Reporting Assistant	IBM	IBM (Aust)	$200	128K 1DD	
Assistant Home Solutions	IBM	IBM (Aust)	$95	128K 1DD	
Executive Solutions Assist.	IBM	IBM (Aust)	$95	128K 1DD	
Sideways	Funk Software	Imagineering	$95	64K 1DD	Printer Utility
Koala Pad	Koala Technologies	Imagineering	$235	64K 1DD	Touch Tablet
Speed Key	Koala Technologies	Imagineering	$250	64K 1DD	Keyboard Utility
D-Util	Fox & Geller	Imagineering	$130	128K 2DD	dBase II Utility
D-Util III	Fox & Geller	Imagineering	$130	128K 2DD	dBase III Utlity
Microsoft Sort	Microsoft	Microsoft	$330	128K 1DD	
dToolkit	ACS Pty Ltd	The Computer Trader	$99	128K 1DD	dBase Utilities

DATA MANAGEMENT

Name	Manufacturer	Distributor	RRP	Min. req.	Comment
Tim IV	Innovative Software	Sourceware	$599	128K 2DD	
dBase II	Ashton-Tate	Arcom Pacific	$540	128K 1DD	
dBase III	Ashton-Tate	Arcom Pacific	$795	256K 2DD	
Knowledgeman	MDBS Systems	Base Management	$854	256K 2DD	PC World Sep 84
Dataflex	Data Access Corp	Intelligence	$1200	128K 2DD	
Condor III 20	Condor Computer Corp	Multisoft	$555	128K 1DD	
RBase	Microrim	Imagineering	$630	256K 2DD	
Data Base Manager II	Alpha Software	SCA	$395	192K 2DD	PC World Aug 84
Datastore	Software Connections	Telecomputing	$650	256K	
Friday	Ashton-Tate	Arcom Pacific	$325	64K	
Micro-FCS	EPS	EPS Consultants	$2500	192K 2DD	
PFS: File	Software Publishing	Imagineering	$175	64K 1DD	
Access Manager	Digital Research	Cullinet Software	$499	12K	
InfoStar/StarBurst	Micropro	Imagineering	$820	128K	
dBase II Multi-user	Ashton-Tate	Arcom Pacific	$1095	192K	
MicroStat	Lifeline Software	Lifeline Software	$402	128K 1DD	
PFS: File	Software Publishing	Imagineering	$175	64K 1DD	
Stat Pack	Lifeline Software	Lifeline Software	$675	128K 1DD	
Delta	Compusoft	Intelligence	$950	128K 2DD	
DMS	Compusoft	Intelligence	$685	192K 2DD	

COMMUNICATIONS

Name	Manufacturer	Distributor	RRP	Min. req.	Comment
Asynchronous Communications Support	IBM	IBM (Aust)	$101	64K 1DD	
Crosstalk	Microstuf	Sourceware	$295	96K 1DD	#
Ascom	DMA	Fagan	$384	128K 1DD	
Display Comm BSC	IBM	IBM (Aust)	$629	256K 2DD	
PFS Access	Software Publishing	Imagineering	$157	128K 1DD	

ACCOUNTING

Name	Manufacturer	Distributor	RRP	Min. req.	Comment
Attache	Attache Software	The Computer Co.	$775	256K 2DD	
IMS Integrity	IMS	Insystems	$1800	128K 2DD	
Sybiz	Sybiz Software	Trackfast	$695	128K 2DD	8 modules
Charter Series	IAL	IAL	$750	360K 2DD	13 programs
Assistant Accounting Solutions	IBM	IBM (Aust)	$125	128K 2DD	

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TUTORIALS

Name	Manufacturer	Distributor	RRP	Min. req.	Comment
Friendlyware	FriendlySoft	Sourceware	$69	64K 1DD	Introduction
The Instructor	Individual Software	Sourceware	$69	64K 1DD	Introduction to PC
Professor Dos	Individual Software	Sourceware	$99	64K 1DD	Adv. DOS training
Tutorial Set	Individual Software	Sourceware	$159	64K 1DD	
Typing Instructor	Individual Software	Sourceware	$89	64K 1DD	
Professor Pixel	Individual Software	Sourceware	$89	64K 1DD	Graphics training
Prof	Crescendo Assoc.	Triad Software	$495	256K, hard d.	Pick Tutorial
PC Pal	CPK	Imagineering	$69	64K 1DD	
PC Tutor	CPK	Imagineering	$110	64K 1DD	
DOS Director	CDEX	Imagineering	$69	128K 1DD	
How to use 1-2-3	CDEX	Imagineering	$105	64K 1DD	
Advanced Lotus	CDEX	Imagineering	$105	64K 1DD	
Making Business Decisions	CDEX	Imagineering	$115	64K 1DD	
Managing Your Business	CDEX	Imagineering	$115	64K 1DD	
Analysing 1-2-3	CDEX	Imagineering	$115	128K 1DD	

GRAPHICS

Name	Manufacturer	Distributor	RRP	Min. req.	Comment
Fast Graphs	Innovative Software	Sourceware	$399	128K 2DD	Basic Package
MicroCAD	Computer Aided Design	Sourceware	$1750	256K 2DD	3D CAD/CAM
Dr Draw	Digital Research	Arcom Pacific	$385	128K 1DD	
Dr Graph	Digital Research	Arcom Pacific	$252	192K	
KGraph	MDBS	Multisoft	$447	256K 2DD	Knowledgeman Utility
KPaint	MDBS	Multisoft	$262	256K 2DD	Knowledgeman Utility
Microsoft Chart	Microsoft	Microsoft	$415	256K 1DD	
Fast Graphs	Innovative Software	Sourceware	$318	128K 2DD	
Graph Writer	Graphics Communications	Sourceware	$1045	256K 2DD	
MicroCad	Computer Aided Design	Sourceware	$1835	256K 2DD	
GraphTalk	Redding	Fagan	$670	128K 1DD	
Energraphics	Enertronics Research	Tech. Imports Aust.	$700	128K 2DD	
Smartwork	Wintek Corp	Tech. Imports Aust.	$1250	256K 2DD	PCB/layout
Cadplan	P-CAD Systems Inc	Tech. Imports Aust.	$2500	512K 2DD	Full CAD
Caddraft	P-CAD Systems Inc	Tech. Imports Aust.	$800	512K 2DD	Entry CAD
CADEC	Communic. Cons. Corp.	Tech.Imports Aust.	$3300	512K 2DD	Elect design
Design Kits	Communic. Cons. Corp.	Tech. Imports Aust.	$2400	512K 2DD	
Graphing Assistant	IBM	IBM	$227	572K 2DD	
Mirage	Zenographics	Dimension Graphics	$2500	320K 2DD	Drawing/charting
Autumn	Zenographics	Dimension Graphics	$670	320K 2DD	Automatic charting
Dr Halo	Media Cybernetics	Fagan	$226	256K 1DD	Screen printing
D-Graph II	Fox & Geller	Imagineering	$345	64K 1DD	
D-Graph III	Fox & Geller	Imagineering	$405	256K 2DD	
Graph Fox	Fox & Geller	Imagineering	$350	96K 2DD	
PC Paint	Visicorp	Imagineering	$295	256K 2DD	

GAMES

Name	Manufacturer	Distributor	RRP	Min. req.	Comment
Flight Simulator	Microsoft	Microsoft	$95	64K 1DD	Color graphics
Deadline	Infocom	Imagineering	$79	64K 1DD	
Sorcerer	Infocom	Imagineering	$69	64K 1DD	
Star Cross	Infocom	Imagineering	$58	64K 1DD	
Suspended	Infocom	Imagineering	$77	64K 1DD	PC World Dec 84
Witness	Infocom	Imagineering	$72	64K 1DD	
Wizardry Disk	Sir-Tech	Imagineering	$79	64K 2DD	
Zork I	Infocom	Imagineering	$60	64K 1DD	
Zork II	Infocom	Imagineering	$60	64K 1DD	
Zork III	Infocom	Imagineering	$60	64K 1DD	
PC Arcade	Friendly Soft	Sourceware	$72	64K 1DD	
Apple Panic	Broderbund	Imagineering	$42	64K 1DD	
Call To Arms	Sirius	Imagineering	$39	64K 1DD	
Crossfire	Sierra On-Line	Imagineering	$45	64K 1DD	
Epidemic	Strategic Simulations	Imagineering	$50	64K 1DD	
Frogger	Sierra On-Line	Imagineering	$48	64K 1DD	
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Hi-Res Ulysses	Sierra On-Line	Imagineering	$57	64K 1DD	
Lode Runner	Broderbund	Imagineering	$59	64K 1DD	
Mouse Attack	Sierra On-Line	Imagineering	$48	64K 1DD	
Pig-Pen	DataMost	Imagineering	$42	64K 1DD	
Sargon III	Hayden	Imagic	$74	64K 1DD	
Snake Attack	Funk Software	Imagineering	$54	64K 1DD	
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Ultima II	Sierra On-Line	Imagineering	$79	64K 1DD	
Hitch Hikers Guide	Infocom	Imagineering	$69	64K 1DD	

INTEGRATED APPLICATIONS

Name	Manufacturer	Distributor	RRP	Min. req.	Comment
Symphony	Lotus	Imagineering	$995	320K 2DD	PC World Aug 84
Lotus 1-2-3	Lotus	Imagineering	$745	192K 2DD	
Corporate MBA	Context Management	Intelligence		256K 2DD	PC World Nov 84
Open Access	SPI	Software Suppliers			PC World July 84
Electric Desk	Alpha	SCA	$465	256K 2DD	
Framework	Ashton-Tate	Arcom Pacific	$795	384K	
Aura	Softrend	Imagic	$795	256K	
GoldenGate	Cullinet Software	Cullinet Software	$1100	320K 2DD	

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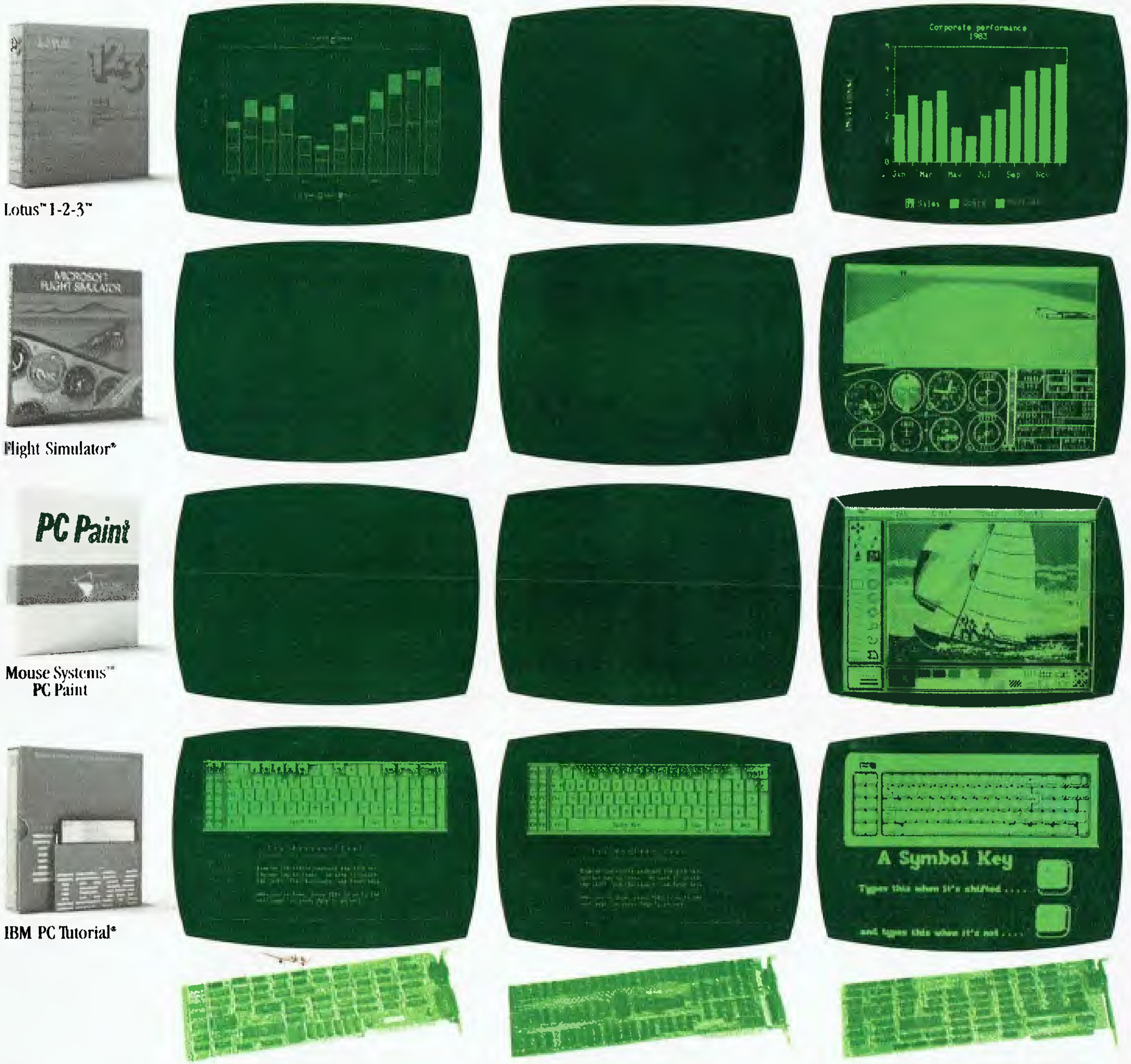
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Australian
PC WORLD
About IBM PCs and compatibles

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The next issue of Australian PC World will incorporate what is perhaps the most comprehensive directory of locally-available PC software ever published — The PC World Bluebook!

THE NIFTIEST WORDBASE

In a follow-up and contrast to his article on expensive and overstuffed word processing packages, Les Stein reviews the powerful, compact and inexpensive Notebook II "wordbase" program.

PC WORLD READER SURVEY

To those readers who responded to our recent survey, many thanks — particularly to the person who sent back seven cents change from the dollar provided for a cup of coffee.

To those other readers who may still be filling in their survey sheet, please send them in soon and, by all means, keep the change.

PC PAINTING SOFTWARE

Inspired by MacPaint, a new type of software has appeared which allows PC users to create and edit color graphic images. Ron Cochrane examines several of these "paintbrush" programs.

FROM ALTAIR TO AT

Over the last decade the microcomputer has grown from being a hobbyist's toy to the serious and innovative business tool that is the PC. This article describes the remarkable progression.

COMPATIBLES UPDATE

Once again it is time for our round-up of the latest and greatest PC compatibles currently available in Australia. Despite bankruptcies and the falling dollar, the list continues to grow.

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